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skin diver

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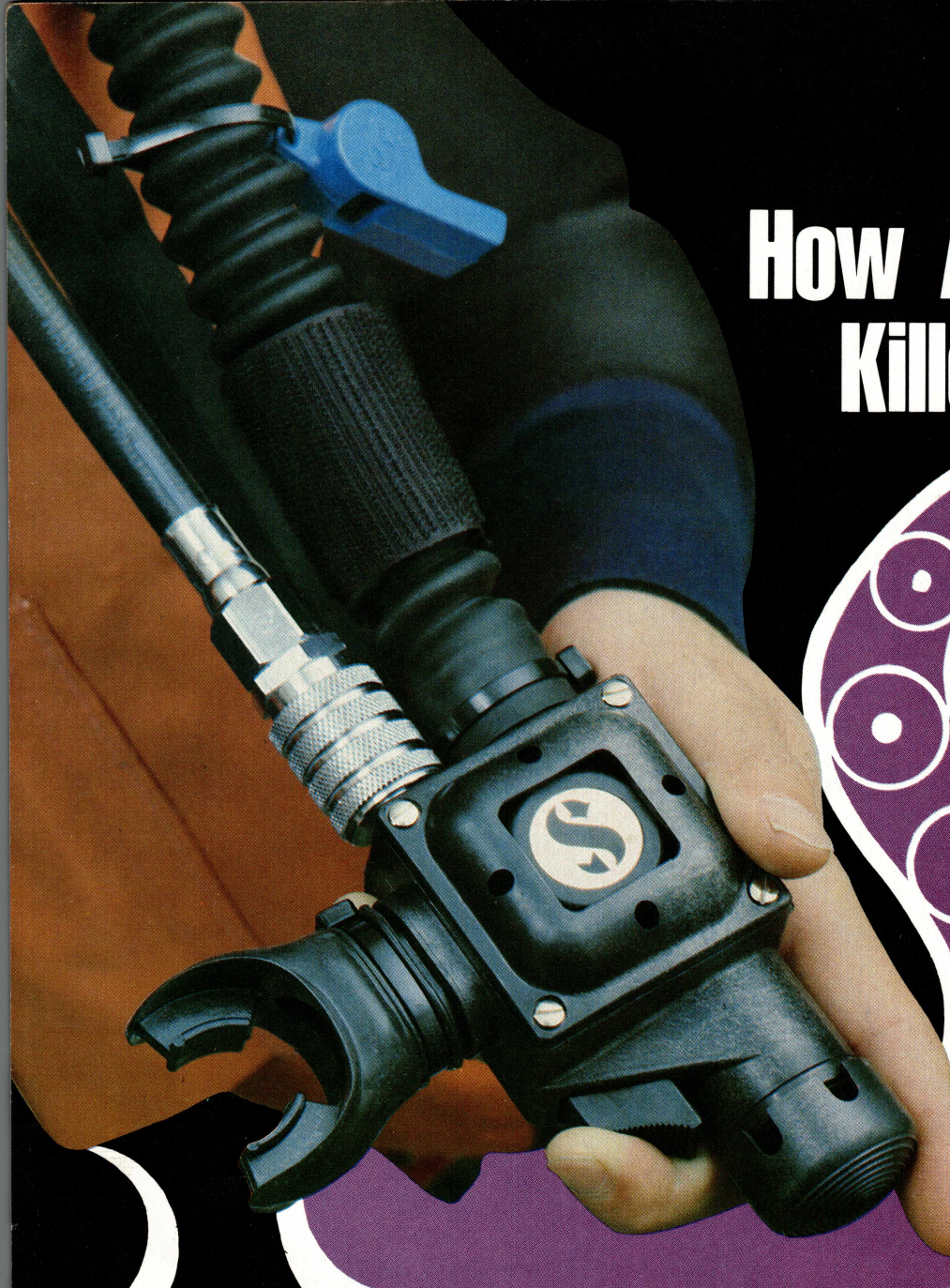
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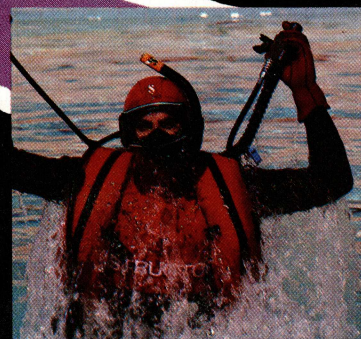
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skin diver

Volume Thirty-One Number Five

PHOTO TECHNIQUES	32	UNDERWATER CLOSE-UP TIPS	JIM AND CATHY CHURCH	Get the most out of your equipment
READER PREMIUM	39	DACOR'S REUTER DIVE TABLES	BONNIE J. CARDONE	No calculations
DIVE EQUIPMENT	55	SCUBAPRO'S DELTA BOOTS	JIM WALKER	
	66	IDI'S SCUBA STAR II REGULATOR	GEORGE COZENS	
	78	LADY'S CASIO WATCH	GERI MURPHY	
	79	IMPERIAL'S ISLANDER 200 WETSUIT	BONNIE J. CARDONE	
	80	THE HENDERSON TROPICAL SUIT	JIM WALKER	
COMMERCIAL DIVING	56	SATURATION SCHOOL	BILL GLEASON	Advanced training for deep diving
FOREIGN TRAVEL	58	BONAIRE	GERI MURPHY	Macro capital of the Caribbean
	89	THE MALDIVES	ERIC HANAUER	The Germans call them paradise
	90	RANGIROA	ROD CANHAM	French Polynesian fantasy
	96	ROMORA BAY CLUB	RICK FREHSEE	From Bahamian estate to full-service dive resort
PERSONALITIES	64	BLACKIE COLLINS		Wenoka's secret weapon
MISCELLANEOUS	65	NIKON'S RUBBERIZED BINOCULARS	GERI MURPHY	
PHOTO EQUIPMENT	68	CANON'S MARINE CAPSULE A	GERI MURPHY	
	76	SUBSEA MARK 150	GERI MURPHY	
DIVE BOATS	72	ZODIAC MARK III GRAND RAID	ERIC HANAUER	
TREASURE EQUIPMENT	74	FISHER PULSE 8 METAL DETECTOR	JIM WALKER	
DEPARTMENTS	7	DIVER'S CALENDAR	37 NEW GEAR	54 NEW BOOKS
	8	TECHNIFACTS	50 Rx FOR DIVERS	62 FISH OF THE MONTH
	19	SCUBA QUIZ		116 DIVER'S DIRECTORY

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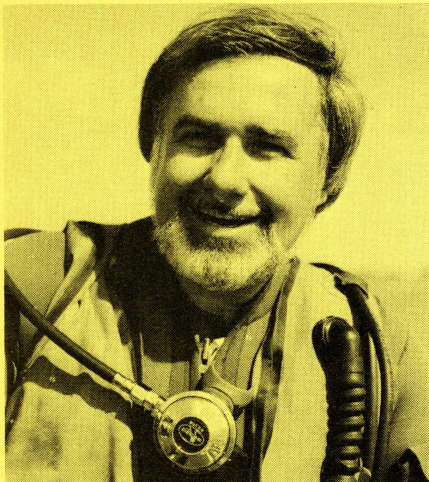
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COVER



Donna McLaughlin emerges from the tropical waters of Bonaire after a successful macro photography foray. Donna works with her husband, Chris, at Photo Bonaire on the grounds of the Flamingo Beach Hotel. The warm waters of Bonaire are rich in nutrients and serve as a fertile nursery for the growth of small, colorful invertebrates and fish which are perfect for macro shots. For a full description of the best macro spots off the island of Bonaire see page 58 in this issue. Photo/Geri Murphy.

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SDM Editorial

BY THE PUBLISHER

SUMMERTIME, SUMMERTIME!

With summer just around the corner, you're probably ready to drag that dive gear out of your closet and dust it off for the new season. Chances are you have not looked at it since it was washed and stored away after last year's diving. There is also a good possibility that some of your dive gear is in need of maintenance, repair or parts replacement.

Dive equipment, particularly its rubber parts, deteriorates with age, regardless of whether it is being used underwater or stored in a closet. The important thing is to inspect your equipment *now*, before that first trip. Give yourself plenty of time to complete the necessary maintenance and shop for replacement parts.

In going over your gear, make a careful inspection of the little things — those insignificant items which are often overlooked or just taken for granted. Here is a handy guide for checking out your gear piece-by-piece. By following this simple check list, you may discover a few potential equipment failures and thus avoid a good deal of aggravation on the dive boat or underwater.

☐ **Mask**—Check the headstrap for signs of cracking or splitting, especially around the buckle area. If it looks suspicious, replace the strap with a new one and buy another for an emergency spare. Treat both straps with a rubber preservative.

☐ **Snorkel**—Check the tab for cracking or tears. Replace if necessary and obtain another tab as a spare. Make sure the mouthpiece section is solidly glued to the snorkel tube. Also check the mouthpiece bit for tears or cracking.

☐ **Fins**—Check the heel straps for cracking or crazing, especially in the buckle area. Replace straps if they look suspicious. Treat all heel straps with a rubber preservative. Also check the fin blades for signs of splitting.

☐ **Wetsuit**—First, check all zippers to make sure they are moving freely, and lubricate thoroughly with zipper-wax or silicone spray. Next, check the seams for

signs of splitting, especially in the armpit and crotch area. Chances are your old can of neoprene cement has hardened like a rock, and you'll have to purchase a fresh can for making necessary repairs. If your suit has sewn seams, check for unraveling threads, and have these seams resealed or reglued.

☐ **Weightbelt**—Make sure you have sufficient lead for maintaining neutral buoyancy at 10 feet. Check the buckle to ensure that it is functioning properly and not slipping. You may also want to consider adding a belt snap to your weightbelt for easy attachment of a dive light, goodie bag or other accessories.

☐ **Buoyancy Compensator**—Inspect the low pressure air inflator to ensure smooth operation. Lubricate all moving metal parts with silicone. Fully inflate the compensator to check for air leaks. Flush the inside of the air bladder with a chemical cleaner to remove or kill any bacteria. If the compensator is equipped with a CO₂ inflator, check and lubricate the inflator mechanism and inspect the cartridge. Also make sure you have a spare cartridge.

☐ **Dive Knife**—Check the blade for rust spots, and remove with special spray. Lubricate the blade with a heavy coating of protective silicone grease. Check the retainer ring on the knife scabbard for splitting or cracking. Also check the scabbard straps for cracking or splitting. Replace necessary parts.

☐ **Regulator**—Attach it to a tank full of air to make sure it is working properly. If you suspect the regulator is breathing hard, have it cleaned and tuned by your local dive shop. Also inspect the sintered filter for signs of corrosion or rust, and take it in for repair if you see any suspicious discoloration. Make sure the exhaust valve is not stuck shut by exhaling into the mouthpiece.

☐ **Octopus Unit**—Your octopus second stage should breathe as easily and as smoothly as your primary unit. If not, have it cleaned. Also check the attachment strap or clip for the octopus to make sure it is not frozen with corrosion.


☐ **Submersible Pressure Gauge**

—Check the dial face for signs of water leakage or interior corrosion. Attach a regulator to the tank and turn on the air while watching the gauge. The needle indicator should move smoothly as the air pressure increases. Also, make sure your pressure gauge is reading accurately by comparing it with either another SPG or a hand pressure gauge. Check the hose fittings at both ends for signs of air leakage.

☐ **Tank**—Have the interior of your tank visually inspected for rust or internal corrosion. This should be done regularly — once a year. Check your tank valve for signs of corrosion and make sure the valve turns on and off smoothly and easily. If it is hard to turn, no doubt it is in need of a thorough cleaning and lubrication by your dive shop repair man. Remove your tank boot and check for signs of external corrosion where the boot has trapped water. Remove the O-ring from the tank valve and replace with a new one if it looks at all worn.

☐ **Backpack**—Check the pack for signs of cracking or corrosion, and inspect the band for signs of wear. Make sure the band is snugly bolted to the pack and the tank cannot wobble or slip when attached to the pack. Check all harness buckles for signs of wear or slippage. Be sure there are no parts missing from the harness assembly.

☐ **Dive Light**—If it is the dry cell type, disassemble and replace the batteries with fresh ones. If it is a rechargeable, the battery should be recharged once every 30 days, even while in storage. Make sure you have a spare bulb for extended dive trips. Check your dive light lanyard to ensure that it is in good shape.

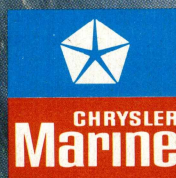
In addition to making a general equipment inspection prior to the dive season, you should go through the same procedure at least two days prior to every dive trip. You'll be amazed to find yourself experiencing far fewer dive gear failures throughout the season. And, you'll feel much more confident knowing your gear is in perfect working order. 

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Diver's Calendar

April 30-May 2 Our World Underwater XII seminar and film festival, Radisson Chicago Hotel and Medinah Temple, Chicago, IL. (Contact: Our World Underwater, P.O. Box 4428, Chicago, IL 60608; or phone (312) 452-4445)

May 1-2 YMCA Scuba Lifesaving and Accident Management Course, with specialty certification for divers and SLAM instructor certification for YMCA instructors. (Contact: Ken McCracken, Land/Sea Passages, 14 E. Water St., Harrisonburg, VA 22801; phone (703) 433-2177)

May 1-June 6 Safety and diver rescue course. Saturdays and Sundays 8:00 am to 2:00 pm. \$50. (Contact: Ben Cariaga, (213) 327-5311)

May 7-9 Second Annual Search and Recovery Seminar at Howard Johnson's North in Cincinnati, OH. Sponsored by the Hamilton County Police Association. (Contact: Sgt. Mark Mathews, c/o Milford Police, 19 High St., Milford, OH 45150 or Ptl. Michael Wylie, c/o Amberley Village Police, 7149 Ridge Road, Cincinnati, OH 45237)

May 8 Second Annual Diver's Day. Symposia, films, lectures, slide presentations and gear displays. Free admission. (Contact: Rich Silanpa, 5200 Claremont Mesa Dr., Kerney Mesa, CA; (714) 277-8900, ex. 3388)

May 8 Sea 82, 18th Annual International Underwater Film Festival, Oakland, CA. With Stan Waterman, Peter Gimbel, Jack McKenney and Paul Tzimoulis. (Contact: Underwater Photographic Society of Northern California, P.O. Box 8291, Emeryville, CA 94662)

May 15 Diving Medicine 1982, Hazardous marine life and other aspects. Six CME and six CH credits. Optional dive trip May 16. (Contact: North Ridge General Hospital, 5757 North Dixie Highway, Ft. Lauderdale, FL 33334)

May 22-23 First Annual West Virginia Underwater Olympics, sponsored by the Mountaineer II Dive Club, Charleston, WV. (Contact: Mountaineer II Dive Club, U/W Olympics, 600 Cross Lanes Dr., Nitro, WV 25143; phone (304) 776-7753)

May 22-29 Annual meeting of the International Society of Aquatic Medicine, Flamingo Beach Hotel, Bonaire, NA. Twelve hours of Class I post-graduate credit. Sponsored by Tulane Medical School. (Contact: Passport to Travel, 949 Westbourne Drive, Suite 4, Los Angeles, CA 90069)

May 29-30 The 19th National Speleological Society Cave Diving Section Safety Workshop, Branford, FL. (Contact: Steve E. Hudson, 893 Cedar Creek North, S.E. Marietta, Georgia 30067)

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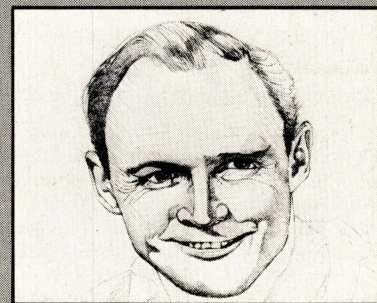
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Technifacts

BY E.R. CROSS



A commercial diver, regardless of the specialty engaged in, has many opportunities to take underwater pictures: construction projects in progress, ships and cargoes being salvaged, or the products of the sea being harvested and processed. All of these picture possibilities are not only of potential commercial value but are more interesting (to some) than photos of sharks, sea anemones, sea weeds and fish.

Pay for a commercial diver's underwater photographs may come from two sources. First, the diver may be compensated for taking the pictures as part of his inspection and report processes. Second, pictures that are shot properly may well have commercial news or entertainment value.

The first consideration in producing a photograph of value is that it must convey specific information from the underwater scene to a topside viewer, usually an engineer, owner, or other person interested in the underwater conditions. The underwater photographer may use still or motion picture photography, color or black and white film, or color or black and white television to record and transmit the underwater scene to the viewer. To be of use and value the underwater photographs must accurately and clearly capture existing conditions.

Basically, a commercial diver is an underwater mechanic who must have a working knowledge and experience in dozens of mechanical skills. Almost

invariably it is easier, and quicker, to make an acceptable photographer out of a commercial diver than it is to make a good commercial diver out of a photographer. Cameras and photographic skills become additional tools with which a diver accomplishes a specific task.

As stated previously, almost every working day in the life of a diver presents challenging opportunities for taking interesting and potentially valuable pictures. Divers in this category should allocate both time and money to become capable underwater photographers. If a diver does not have photographic skills, several classes and photography schools advertising in SKIN DIVER Magazine offer such training. However, most seminars and schools

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will not teach techniques applicable to offshore oil or marine construction and salvage. Since commercial diving is largely an exercise in adapting topside tools and techniques to underwater use, this should not prove a problem to a well-qualified diver.

If cost is no object, and if financing is available, an underwater TV system should be the first choice as a means of recording underwater conditions, both as part of a report and for other commercial use. There are several advantages in using underwater TV. The information is being transmitted to the surface now. The person concerned with the underwater inspection can make decisions regarding a host of conditions affecting the ultimate quality of the picture being received; focusing, close or distant view; change of angle; change of light position or intensity. The diver can be directed to make specific measurements that are viewed and become part of the record. Finally, and this is of growing importance and use, the scene can be recorded instantly and permanently on videotape, thus permitting instant replay, rapid review and stop action.

Again, referring to the original investment, if finances are available for a color TV system this is preferable to black and white. Color will probably have more uses, will give a more accurate picture of underwater conditions, and permit

rental or use charges for equipment more nearly commensurate with the quality of equipment and of the results obtained.

While underwater TV is not new (Technifacts author used underwater TV during the first and second atomic bomb tests at Bikini Atoll in July, 1946) it has been only in very recent years that systems have been utilized to their fullest potential. This is particularly true in the offshore oil industry where diver held and remote control systems are in daily use as one of several nondestructive test inspections of deeply submerged structures.

Indications are that within a very few years underwater TV will be the primary method of recording visual information in offshore oil industry inspections. This may also be true in a few other areas of underwater construction such as outfall sewer jobs and other government projects where there is usually better funding. The above fields of diving employ nearly 5000 divers out of a total of approximately 6000 divers employed worldwide. For the 900 plus non-oilfield divers, whose funding specifically for underwater photography inspection is low or non-existent, less expensive conventional still and motion picture cameras will still provide excellent results when used properly. Also, the ability of a commercial diver, either working on a full or part time basis, to use either still or

motion picture cameras in a professional manner will provide an important additional tool that will enhance his job and earning potential.

A great many factors will dictate the choice of an underwater camera. One of these is available funds. Divers sometimes put too much emphasis on the purchase of expensive equipment. A more important factor in many cases would be diver familiarization with the equipment. This would permit the most complete use of, and best results from the system. Ikelite, 3303 North Illinois Street, Indianapolis, Indiana 46208 manufactures housings for most conventional SLR cameras. The use of a housing permits a diver to use the camera he is familiar with and with which he can consistently get good pictures. For the diver who can readily adjust to any camera, the Nikonos system is excellent for almost any commercial diving job.

Ikelite also makes camera housings for several Super 8 and 16 mm motion picture cameras. It is recommended that commercial divers use Super 8 or 16 mm systems. Also available for motion pictures, is the Eumig Nautica Super 8 camera (Helix, 325 West Huron Street, Chicago, Illinois 60610). All of these cameras, using either 35 mm for still pictures or Super 8 and 16 mm film for motion pictures, should, when properly used, produce excellent pictures

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for reports and, with experience, photos and motion pictures of potential value for publications or lectures.


In taking pictures for use with reports, the emphasis should be on conveying the subject of the report graphically. While proper composition within the picture may help do this, composition itself is secondary to showing clearly and fully what the report is all about.


Suppose, for example, you are a commercial diver employed to inspect and maintain a large submarine oil pipeline. In one of the inspections you find evidence that leads you to believe the concrete coating on the pipeline is wearing and breaking up along the bottom. The potential problem was discussed with the engineers in charge of the pipeline system and it was decided divers should jack the pipe clear of the ocean bottom to permit inspection and underwater photographs of any damage to the coating or pipe. Divers first raise the line a few inches off the ocean floor by using large hydraulic jacks. Mirrors are placed under the pipe to permit viewing its bottom, at which time it is determined the concrete coating and subsequently the metal of the pipe have become worn. For inspection purposes the diver, using either still or motion pictures, focuses on the image of the bottom of the pipe in the mirror and records it for topside engineers. Probably a general view of the damaged area would be required with one or more close views of specific areas to show the extent of wear or other damage.

If the diver wanted to record the information for publication or for a lecture, or as a training film for the oil company, he would photograph each step of the operation, including the reason he suspected wear, the jacking up the pipe, the inspections and probably any work that was done toward preventive maintenance. In each step the diver would take establishing shots, medium shots to show more detail of what is going on and close shots of any interesting aspects.

In the first case the written report would carry most of the information. Photos would document this and make it possible for engineers to better evaluate the problem. The diver has been able to make his report and his own services of more value to the employer.


In the second case the photos, or motion picture, would carry the story line and a verbal report would be used only to help clarify certain aspects. In this latter case the diver has taken a series of photos or motion picture scenes that have potential value as illustrations for a technical article, as part of a paid lec-


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
TECHNIFACTS

ture, or as instruction material for advanced diving classes.

In almost all underwater photography a commercial diver will find it is best to use color film. Black and white film records colors as various shades of gray, from white to black. Different colors photograph as the same shade of gray and definition is sometimes lost. This is not true when using color, particularly if supplemental light sources are used. If color prints are needed quickly to file with a report, it is probably best to use a negative color film from which prints can be made directly. Ektacolor and Kodacolor are negative color films. If slides are to be the ultimate results, positive color films are best, such as Kodachrome or Ektachrome, or similar films. Black and white prints can be made from either negative color film or from positive color film by making an internegative. Color slides can be made from negative color film, or color prints from positive color film but this takes several days, or longer, as compared with overnight service for normal processing.

Within the past couple years 110 film cameras have been developed for underwater use. One of these is the Minolta Weathermatic. This unit has restrictive depth limitations for most commercial diving jobs. The Sea and Sea 110 system can be used to about 150 feet. The complete system is priced in excess of \$400 but this includes motor drive, built-in flash and accessory strobe. It can be fitted with a close-up lens for detailed inspection work.

The 110 cameras offer an opportunity to economically get into underwater photography and can be quite useful for photography that is to be used to supplement written reports. However, a commercial diver who may want to sell his slides, or to use them in lectures, should start with and stay with 35 mm cameras. Most editors will accept, and may prefer, 35 mm slides for stories. With the fine grain in today's color films, 35 mm slides can be enlarged or projected to almost any size.

A useful camera for commercial diving is the Polaroid SX-70. In an Ikelite underwater housing it is an important part of many commercial divers' equipment and goes on all dive jobs. It permits almost instant color photography of damage or other conditions that need study by engineers to determine a prompt course of remedial action. The housing is somewhat limited in depth and the film produces a somewhat flat, greenish color but these minor problems are more than offset by the instant availability of a usable picture. 

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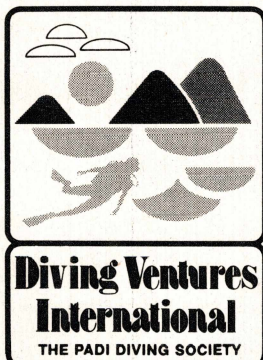
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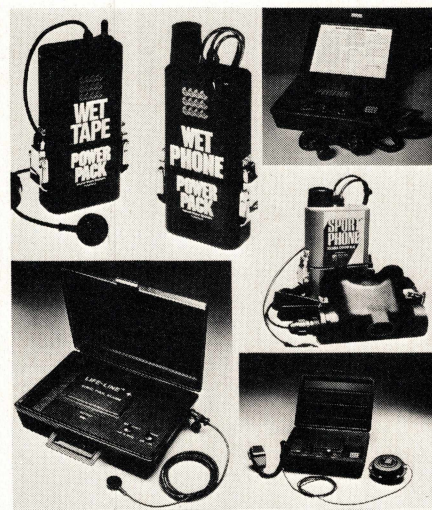
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SOUND WAVE ACQUISITION

Microsemiconductor Corporation of Santa Ana, California has acquired Sound Wave Systems Inc., a Costa Mesa, CA based manufacturer of underwater sonar communications equipment.

According to Philip Frey Jr., president of Microsemiconductor, Sound Wave



Systems Inc., will become part of Microcommunications Inc., a well known manufacturer of dials, telephones and other telecommunications devices.

Sound Wave Systems' products include Wet-Phone, a wireless, portable underwater communications device which is the only system of its kind to be approved by the U.S. Navy; Wet-Sound, an underwater public address system that enables instructors to talk to divers or swimmers from pool side; and Life-Line, a revolutionary sonic swimming pool alarm system.

PHOTO COMPETITION

The California Beach Dive Photo Competition will be held in Monterey on July 10 and 11. Participants receive one roll of film and are given five hours to use it. All photos must be taken on beach dives in the Monterey area between the hours of 9:00 am and 2:00 pm July 10. Judging and award ceremonies will be held July 11. Photographers will be placed in three categories: novice, amateur and open. Photos will be accepted in five categories: macro, marine life normal, marine life wide-angle, and humorous. Above water shots will be accepted if they include divers or dive equipment as a focal point. All teams must pre-register.

Individual and team awards will be given and a drawing for door prizes will be held.

For more information contact Alameda Divers, c/o Divers Exchange, 649 Pacifica Avenue, Alameda, CA 94501.

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CUSHMAN NAUI PRESIDENT

Larry Cushman, president and chief operating officer of the Ocean Corporation in Houston, Texas, was elected president of NAUI at the recent board of directors meeting in Toronto. John Englander, owner/manager of UNEXSO in Freeport, Grand Bahama, was elected first vice president.

Larry Cushman became a NAUI instructor in 1962. His past NAUI contributions include developing the specialty diver certifications, the origination of the NAUI Diving Association (NDA) and the co-founding of the International Conference on Underwater Education (IQ).

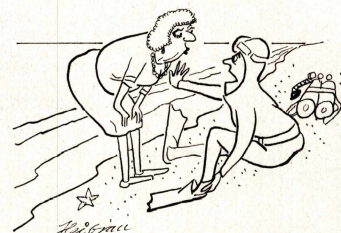
Larry has been in the commercial offshore diving business since 1968 and is currently president of the Association of Commercial Diving Educators (ACDE) and the National Association of Diver Medical Technicians (NADMT), and is a member of the Undersea Medical Society (UMS) Diver/Medic Subcommittee. His present work with the Ocean Corporation includes the training of commercial divers, underwater NDT technicians and diver medical technicians, and specialized underwater inspection, maintenance and repair projects in nuclear power plants.

LEAGUE FOR COASTAL PROTECTION

Dedicated to preserving the natural beauty of California's coast, the League for Coastal Protection hopes to concentrate public interest and environmental organizations as well as individuals in a coalition powerful enough to maintain a constant and visible presence in the State Capitol.

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An individual membership is \$20 per year, students and senior citizens, \$7.50. Group memberships are \$200. For membership information contact the League for Coastal Protection, 1228 N St., #29, Sacramento, CA 95814.



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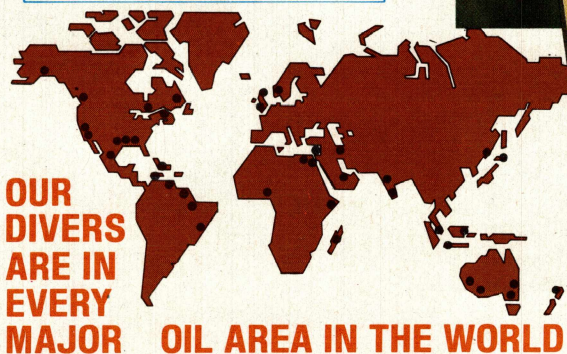
Oceaneering International designed Commercial Diving Center's training programs, moving over 40% of the graduates into key jobs under world-wide diving contracts. The others may opt to work for some 200 diving contractors who look upon C.D.C. as a producer of high-quality trainees ready to take on any job with any type of equipment.

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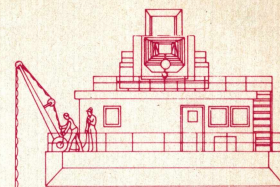
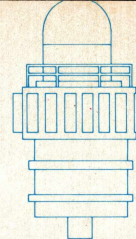
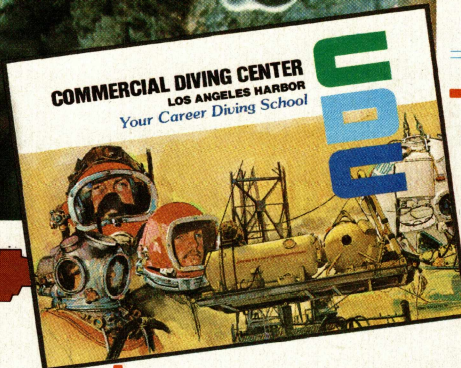
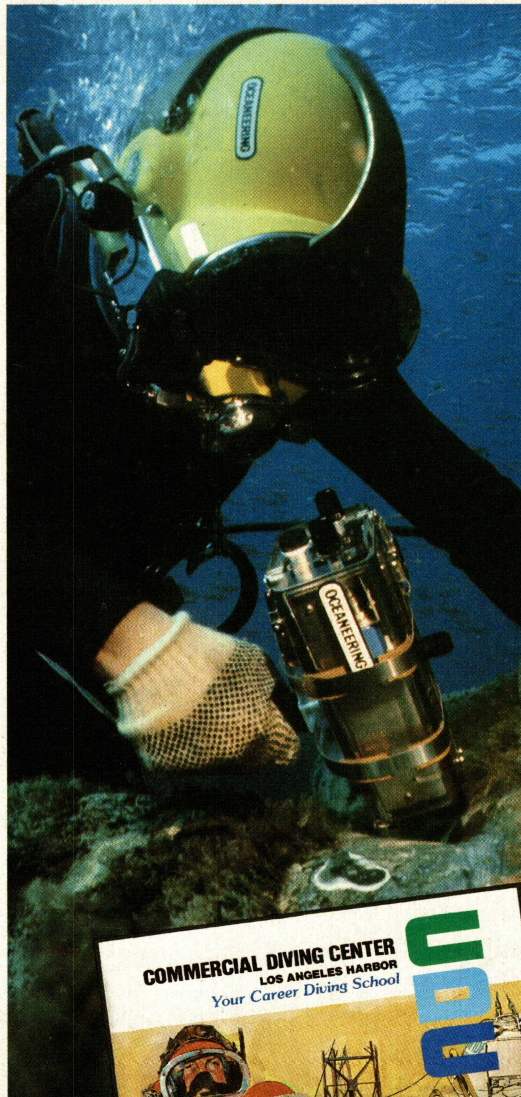
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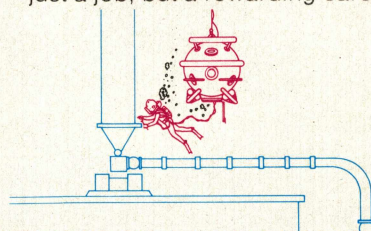
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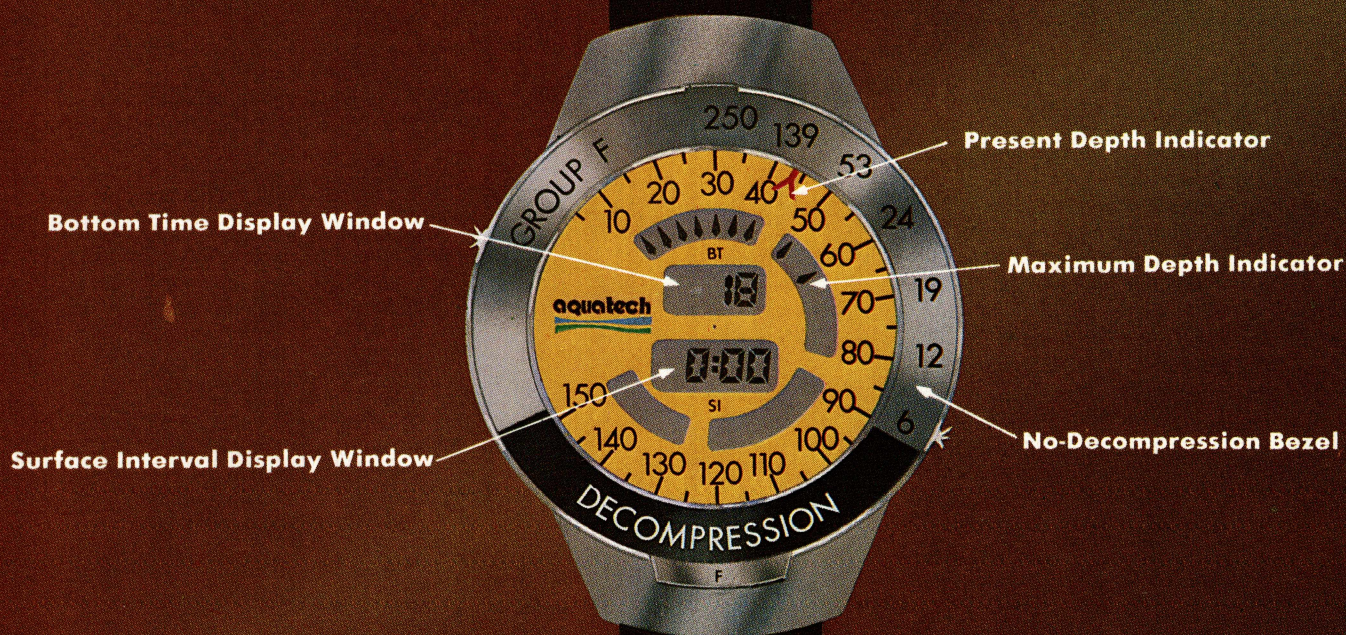
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Scuba Quiz

Category: BC Use

By Dennis Graver

Buoyancy control is perhaps the single most difficult skill to learn in diving. Major buoyancy adjustments are made with weighting, and minor adjustments can be made with breath control, but most adjustments are made with the buoyancy control device (BC). See how proficient you are in using this very important item of dive equipment. The answers are on the following page.

1. To locate the inflation/deflation hose on a BC underwater:

- ☐ A. Keep the end of the hose secured so you'll know where to find it
- ☐ B. Allow the hose to float above you so you'll know where to find it
- ☐ C. Reach for the hose at the point where it attaches to the BC and follow the hose to the end
- ☐ D. Store the inflation/deflation hose end in the pocket of the BC when the hose is not in use

2. To activate a CO₂ cartridge on a BC:

- ☐ A. Pull down firmly and repeatedly on the cord until the cartridge fires
- ☐ B. Pull down and side-to-side on the cord until the cartridge fires
- ☐ C. Give one firm yank on the cord, then abandon the effort if the cartridge doesn't fire
- ☐ D. Pull upward firmly and repeatedly on the cord until the cartridge fires

3. When adding air to the BC underwater, it is best to:

- ☐ A. Add less air than you think will be needed
- ☐ B. Add the exact (estimated) amount of air you think will be needed
- ☐ C. Add more than the amount of air you think will be needed
- ☐ D. Exhale deeply to compensate for the increase in buoyancy which will take place

4. Which of the following statements regarding low pressure inflators for BC's is false:

- ☐ A. When using a low pressure inflator, air should be added to the BC in short bursts underwater
- ☐ B. A diver who runs out of air at depth and surfaces will be unable to inflate the BC with the inflator
- ☐ C. The use of low pressure inflators is recommended by instructional agencies and will eventually become mandatory equipment
- ☐ D. All of the above statements are true

5. Which of the following practices will help prevent water from entering a BC:

- ☐ A. Use of a purge-type mouthpiece for oral inflation
- ☐ B. Not holding the exhaust valve open any longer than necessary
- ☐ C. Pointing the deflator hose mouthpiece downward while deflating the BC
- ☐ D. All of the above

6. During most shore entries and exits, the BC should:

- ☐ A. Be deflated for increased mobility
- ☐ B. Be about half inflated for some buoyancy
- ☐ C. Be fully inflated for maximum buoyancy
- ☐ D. None of the above

7. When snorkeling on the surface with a front-mounted BC, the device should be:

- ☐ A. Fully deflated to reduce drag
- ☐ B. About one-third to one-half inflated for some buoyancy
- ☐ C. Fully inflated for buoyancy and visibility
- ☐ D. None of the above

8. After you rise and swim over a reef, you realize you are floating rapidly to the surface from excessive buoyancy. The correct action is to:

- ☐ A. Exhale and swim downward while venting the BC
- ☐ B. Vent the BC, control lung volume, and flare out
- ☐ C. Increase your surface area, control lung volume and ride it out
- ☐ D. Relax, breathe normally, surface and redescend

9. To achieve neutral buoyancy underwater:

- ☐ A. Adjust for neutral buoyancy at the surface, and add one breath to the BC for each 15 feet of depth
- ☐ B. Add air to the BC until you just begin to rise in the water after exhaling
- ☐ C. Vent air from the BC while exhaling slowly until you just begin to sink
- ☐ D. Adjust the BC volume until you begin rising when inhaling slowly and sinking when exhaling slowly

10. Which of the following differences apply to oral inflation of the BC underwater as compared to oral inflation at the surface:

- ☐ A. Air is inhaled from the regulator underwater and from the atmosphere at the surface
- ☐ B. The BC mouthpiece is cleared of water underwater, but not at the surface
- ☐ C. Much more air is put into the BC at the surface than is put into it underwater
- ☐ D. All of the above

Scuba Quiz

Answers: BC Use

1. C. Reach for the hose at the point where it attaches to the BC and follow the hose to the end. This point remains relatively constant and helps the diver locate the hose consistently. Grabbing where you think the hose will be can be frustrating and even dangerous if you should become excessively buoyant and are unable to locate the hose quickly.

2. B. Pull down and side-to-side on the cord until the cartridge fires. The CO₂ cartridges in BC's are oriented vertically or horizontally with some to the right and some to the left. Pulling down on the cord may not puncture the cartridge, depending on its orientation, but pulling down and side-to-side will activate a properly maintained cartridge regardless of its position.

3. A. Add less air than you think will be needed. There is a delay in the effect of buoyancy underwater. Since water is 800 times denser than air and since it presents resistance to movement through it, it's necessary to wait a few seconds after a buoyancy adjustment to note its effect. Beginning divers don't seem to perceive this, which contributes to their buoyancy problems.

4. B. A diver who runs out of air at depth and surfaces will be unable to inflate the BC with the low pressure inflator. A diver out of air at depth still has air in the tank! The air becomes available as the pressure decreases during ascent. Tests have proven that a diver out of air below 30 feet can still inflate a BC with the low pressure inflator after surfacing.

5. D. All of the above. Water inside your BC is not desirable. Salt water is bad, but pool water is especially undesirable. Learn the tricks of keeping water out of your flotation device and you'll have fewer maintenance problems. Some BC's with low pressure inflators and special dump valves minimize the problem.

6. B. Be about half inflated for some buoyancy. You need to be buoyant during an entry, but excessive buoyancy can cause problems. If properly weighted, a few breaths of air into the BC are sufficient to provide flotation without reducing mobility, restricting respiration, or reducing stability in the water.

7. B. About one-third to one-half inflated for some buoyancy. A diver should be buoyant at the surface, able to become motionless at any time to rest and breathe without sinking. Again, though, excessive buoyancy causes problems, such as a tendency to roll over from the snorkeling position. Excessive drag is another factor. BC's rarely, if ever, need to be used to their capacity.

8. B. Vent the BC, control lung volume, and flare out. I see divers frequently trying to vent air from flotation devices while in a head-down position. It doesn't work. Runaway ascents can be dangerous, resulting in lung injury. Develop the habit of putting one hand on your BC exhaust valve each time you ascend, even if it's only a few feet. Be alert to buoyancy changes. Know that a spread eagle position will slow ascent drastically. Be in control of buoyancy at all times.

9. D. Adjust the BC volume until you begin rising when inhaling slowly and sinking when exhaling slowly. Remember the delay in the effects of buoyancy underwater. Also remember that buoyancy adjustments are necessary each time you change depth. And don't forget that the more you overweight yourself at the surface, the greater your buoyancy problems will be underwater — even if you have sufficient flotation to overcome the extra weight.

10. A. Air is inhaled from the regulator underwater and from the atmosphere at the surface. Even that difference is questionable, because the last breath taken from the regulator upon surfacing should be exhaled into the BC (unless you have the highly recommended low pressure inflator). Inflation should take place with the mouth below the surface to conserve energy, so the mouthpiece does need to be cleared during oral inflation at the surface. Finally, if more than three or four breaths of air are needed for buoyancy, either at the surface or underwater, you are overweighted.

A great deal of safety hinges on buoyancy control. That's why it is very important to be proficient in the separate skills pertaining to it. Buoyancy control skills are sometimes taken for granted because the concept is so simple: add air if heavy and exhaust air if buoyant. But, while the concept is simple, the application of it is not. Knowledge, practice, training, and experience are all necessary. I feel that better buoyancy control skills would substantially increase diving safety. Instructors are encouraged to devote more training in their courses to this important ability and divers are urged to learn more about it if buoyancy control poses problems on a regular basis.

Commercial Diving Is Serious Business



The demand for natural resources from the sea has never been greater. Twenty years ago, there were only a handful of offshore drilling rigs located in coastal and gulf waters. Today, there are thousands of deep-water platforms throughout the world. The need for qualified personnel to man and operate these facilities is ongoing. Your entry into the world of deep-sea diving will be a most prestigious and rewarding career. *Not only is there a demand for divers in the oil industry, but underwater construction, salvage, farming and environmental awareness need trained technicians also.* Your first step to employment as a commercial diver is training.

Divers Institute of Technology (DIT) was founded by men who have successfully met the challenges of inner-space. They know from experience what it takes to get the job done. Retired Navy and professional deep-sea divers joined forces over 13 years ago to establish a commercial diving school that would train and graduate only qualified entrants to the industry. The success of the DIT program can be measured by our physical growth, the credentials we have attained, and not only the number of top workers we have supplied to major commercial diving firms throughout the world in the oil industry, but to companies in

salvage and repair, inspection, underwater farming, etc. *We do not specialize only in the oil industry as some schools do.*

Divers Institute of Technology developed a six-month course that set an industry standard. Training is based on a highly sophisticated deep-sea diving program that prepares you both mentally and physically to enter this new environment. Our curriculum has been designed to prepare you for gainful employment in *all fields* of commercial diving, *not only in the oil industry.* Classroom instruction deals in facts and theory. Open water instruction gives you the practical application of classroom techniques. *The culmination of your training is actual dives to depths of 200 feet. To our knowledge, we are the only commercial school that puts you to this test. The confidence gained from this experience is unequaled.* Before you decide which school to attend, check this point out. Many schools provide only simulated deep dives in recompression chambers and diving tanks on dry land.

After proper training and graduation, you are prepared to enter the commercial diving field. It is then that you will realize a great deal of responsibility comes with the territory. Responsibility to perform the tasks you were trained to do! Responsibility to your diving team and responsibility to all support personnel. *DIT will not graduate a student unless confident he possesses the ability to become a qualified commercial diver.*

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SEA 82

The Underwater Photographic Society of Northern California is presenting SEA 82 on May 8. An Underwater Film Festival and Photography Competition, it will be held in the Paramount Theatre, Oakland, California.

Master of Ceremonies, Stan Waterman, will show one of his latest films, and will host an evening of the world's best underwater films. Peter Gimbel and Bob Hollis will present footage from the recent *Andrea Doria* expedition. Jack Mckenney is bringing his most recent film on British Columbia, and Paul Tzimoulis will present one of his humorous and colorful slides shows. Also featured is a film by Ozzie Wissell.

The winning prints from this year's International Underwater Photography Competition will be on display in the theatre lobby, and the winning slides will be shown during intermission. The doors open at 7:00 pm, with the show beginning at 8:00. Tickets are \$7 and seating is reserved.

For tickets call the Paramount Theatre: (415) 465-6400. For information contact: SEA 82, P.O. Box 8291, Emeryville, California 94662.

MIAMI EXPOSITION

The Miami Undersea Exposition will be held June 4-5 at the Miami Springs Villas near Miami International Airport. The show will feature several well-known underwater photographers as well as displays by nearly 30 dive equipment manufacturers, dive resorts, boat manufacturers, dive retailers, underwater photo companies, dive magazines and related industries. Featured at the two evening main shows will be underwater cinematographer Jack McKenney, adventure editor of SKIN DIVER Magazine; Rick Frehsee, whose articles and photography are featured in dozens of magazines including SKIN DIVER; and master of ceremonies, Paul Tzimoulis, editor-publisher of SKIN DIVER. Seminars (open to the public) on diving and underwater photography will run all day Saturday, June 5. Dacor Corporation and Farallon/Oceanic will be holding dealer seminars for area dive retailers on Saturday as well as displaying to the general public.

Seating for the event has been limited to 1000 persons per show. Tickets to guarantee your seat can be obtained for only \$4.50 per person at many Miami area dive stores or by mailing your check to: Miami Undersea Exposition, 695 NW 115th St., Miami, FL 33180. Please state the date you wish to attend. Accommodations for out of town visitors are available at the Miami Springs Villas through the show at reasonable rates.

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Now there's a sport that gives skindivers as much of a thrill above the water as below it.

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So this summer, why not try sailboarding. Who knows? You may just hang up your wet suit to dry.



For additional information and the name of the BIC Sailboard dealer nearest you, call 800-243-6699, or write: BIC Leisure Products Inc., 1070 Sherman Ave., Hamden, Conn. 06514

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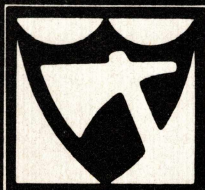
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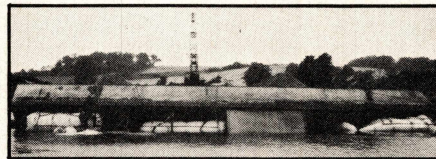
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PONTOON SALVAGE

Using Automarine lift bags, local divers at the Weybread Pit, England raised a 50 ton, twin pontoon dredging barge from a depth of 30 feet. In this operation, 56 tons of lift (provided by the bags) was used to assist in the righting of the craft.



Initially, the dredge was partly flooded to achieve a partial turn and the lift bags were then attached to the opposite side of the barge and inflated to complete the roll-over. Once righted, the craft was sealed, pumped out and towed to shore. The operation was performed by a three man diving team over ten days. 🐠

GOLD SALVAGE

An \$81 million fortune in czarist gold lifted from the wreckage of a British warship 800 feet deep in the frigid Arctic Ocean has been divided between the Soviet and British governments and the now-rich divers.

The gold, entombed since the ship was torpedoed 39 years ago, was in 400 22 pound ingots stamped with the double-headed eagle of the czars of Russia and was originally bound for the United States to pay for Soviet-purchased World War II munitions.

The salvagers and divers will get 45 percent of the treasure.

Two-thirds of the remaining gold, with each bar worth more than \$85,000 at current prices, will go to the Soviet Union, and a third will go to Britain — reflecting the proportion insured. The United States collected full insurance long ago. 🐠

CHAMBER OPERATORS COURSE

A seven day Hyperbaric Chamber Operators Course will begin on June 12, at the Jensen Beach campus of Florida Institute of Technology, according to Charlie Vallance, Underwater Technology Department head.

The course is designed to qualify individuals in the basics of hyperbaric chamber operation and maintenance. Areas covered include: design theory, operational procedures, routine maintenance and the basic application of therapeutic treatment tables. Approximately 75 percent of the course will involve hands-on operation of hyperbaric chambers.

For further information contact: Charlie Vallance, Florida Institute of Technology, 1707 N.E. Indian River Drive, Jensen Beach, Florida 33457. 🐠

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If you haven't tried Plana or Power Plana fins yet, you're in for one of diving's big kicks.

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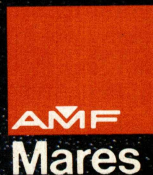
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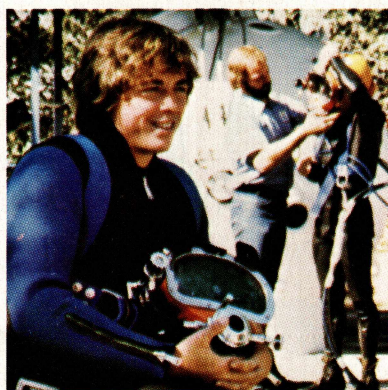
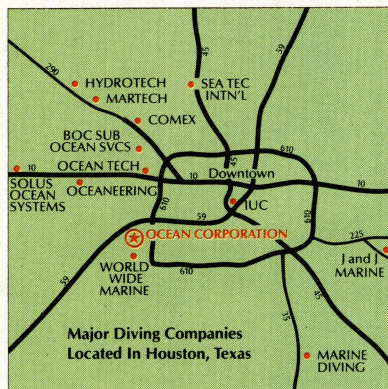
SeaQuest, Inc., 722 Genevieve St., Suite N, Solana Beach, CA 92075, (714) 755-5196. In Hawaii — Rann, Inc., 2979 Koapaka St., Honolulu, HI 96819. In Canada — Seaway Manufacturing Ltd., 17919 Roan Place, Surrey B.C. V3S 5K1, (604) 576-1317.



Why Houston?

BECAUSE

The Ocean Corporation is located in Houston and more commercial divers are hired in Houston than in any other place in the world. Twelve diving companies are located in Houston including three of the four largest in the U.S. Many others are located in the nearby New Orleans area. The demand for divers is so great in Houston that large locally based diving companies like Ocean Systems, Hydrotech Systems, Martech International and Sea Tech International have hired many of our students for part-time work while they were attending school. Over 90% of our recent graduates went to work for these and other local diving companies when they completed our program. Houston is the place where the action is... the commercial diving, offshore construction and oil industry capital of the world.



BECAUSE

The Ocean Corporation is a commercial diving company, not just a school. Our facilities, equipment and training aids are the best, and our diving systems are as up-to-date as possible... because much of the equipment is used by our diving operations division to perform actual diving contracts in the field. Ocean Corporation has successfully completed many underwater jobs for various industrial clients over the years... including specialized underwater inspections, maintenance and repair work. For example, we did the world's first commercial underwater repair job in a nuclear power plant. And most of our divers have been graduates of our own school.

BECAUSE

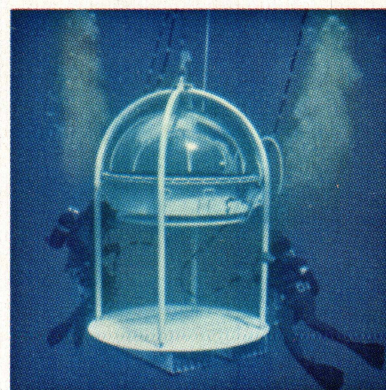
The Ocean Corporation is a convenient and exciting place to go to school. Houston is one of the fastest-growing and most dynamic cities anywhere. It is a city of expansion, energy and youth (the average resident's age is in the mid-20's). Houston offers every conceivable kind of entertainment, from sports events, ultra-modern discos and open-air theater to rough-house local rodeos, chili cook-offs and the new Texas-size



country-western dance clubs. Reasonably priced adult and singles apartments are readily available within walking distance of the school, and fast-food to luxury restaurants are nearby. The semi-tropical climate is wonderful, the sport diving is great and the folks are friendly.

BECAUSE

The Ocean Corporation management and instructor staff have long-term experience in the international offshore oilfield diving business. Retired ex-military divers and sport scuba divers don't run the school... commercial divers do. For example, the President of The Ocean Corporation, Larry



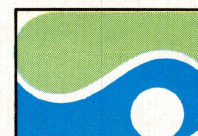
Cushman, was Vice President and Europe/Africa Area Manager for Ocean Systems, Inc. for three years... with responsibility for all North Sea diving and underwater construction operations. He also worked six years as a manager for Oceaneering International, Inc., another of the world's largest commercial diving contractors. Ocean Corporation managers and instructors know today's diving business... first-hand, from recent experience.



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CALYPSO TO AMAZON

The Cousteau Society's famous research ship, the *Calypso*, is off on a new journey, which will take its crew members up the Amazon River in South America. They will spend the next year filming and studying the environment in and around the world's largest river. During the last 14 months in *Calypso's* home port,



Norfolk, VA, the converted World War II minesweeper has been painted, repaired, and had some of its mechanical equipment replaced.

Part of the renovation included the replacement of the ship's two main electrical power generation engines. A pair of new Detroit Diesel 6-71s were provided by the Detroit Diesel Allison Division of General Motors Corporation.

In addition, the *Calypso's* main propulsion engines, two original GM Cleveland 8268A diesels, were also overhauled.

The *Calypso* was constructed in Seattle, WA, in 1942 as a minesweeper for British service. It was acquired by Capt. Cousteau in 1950 and has served as the Cousteau Society's oceanography laboratory since that time. The 139 foot vessel carries a crew averaging 27 members when fully deployed for missions including diving, filming and scientific research.

WATER CYCLE FILM

Produced by Jim Dutcher, *Ring of Living Water* follows a single drop of water as it passes from rivulet to river to ocean to cloud to rain and snow. The main focus of the film is the continuous evolution of life as it flows with the water cycle. The pollution of this cycle is a secondary theme. The two topics are explored, illustrating life's gradual adjustment over millions of years to the shift in the earth's vital systems, and how the ever-quicken- ing pace of change is making it increasingly difficult for life to adapt.

Ring of Living Water will be released this summer.

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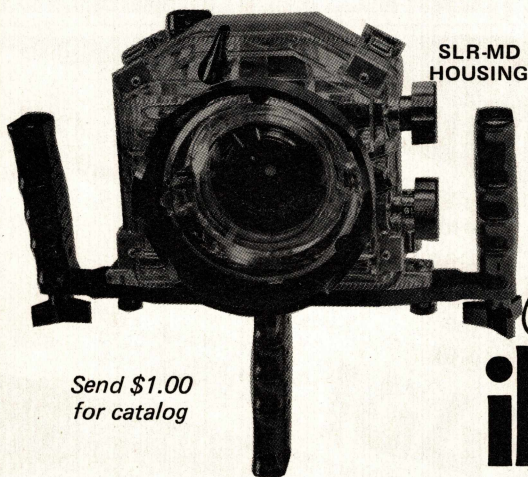
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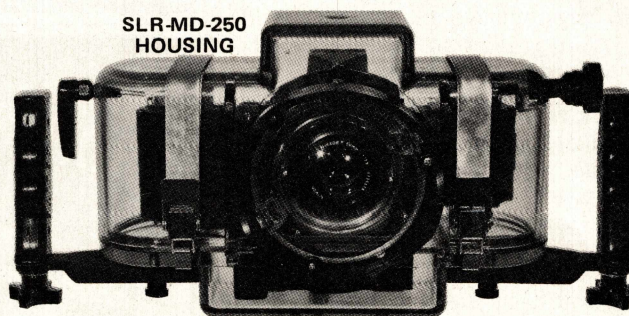
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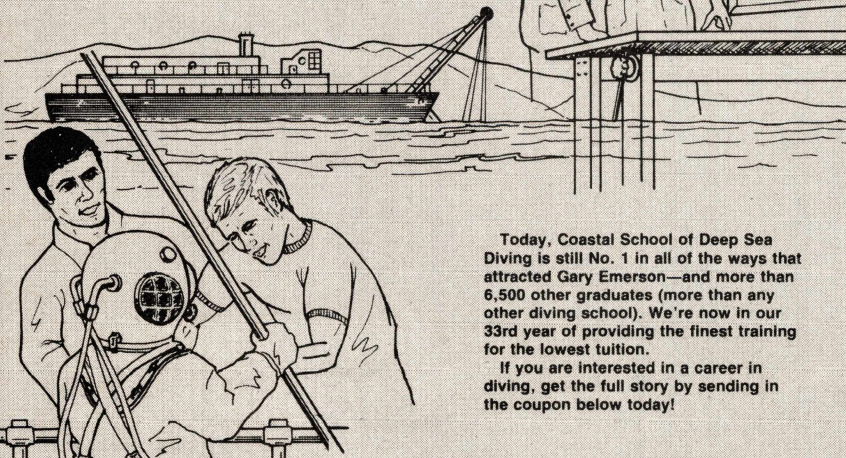
says graduate Gary Emerson
now owner/operator of DREDGEMASTERS,
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"After high school, I spent nine years not really knowing what I wanted to do. The Navy: four years and an introduction to Scuba and Hookah diving. Then, a resort business: three years—successful, but not satisfying. Finally, small scuba diving jobs..."

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and your buddy could win a four day dive adventure in the Bahamas.

"Over the past 25 years," says Frank Sanger, president of Parkway, "many thousands of people have worn — and are wearing — Parkway exposure garments. We'd like to see what they're wearing today, so we're inviting them to photograph themselves in a Parkway suit — any suit, topside or underwater — and send the picture to us."

From all entries received, on September 1, Parkway will impartially draw two photos. These two winners will each receive a four night diving adventure in the Bahamas, all expenses paid... and each winner may select a dive buddy to share his or her adventure, also with all expenses paid.

The Parkway-sponsored trip will be conducted by Omorka Tours at the South Ocean Beach Resort in Nassau and includes round trip air fare, hotel accommodations, food, all dive gear, plus the use of a 40 foot fully-equipped dive boat.

Photos can be in color or black and white and any size up to four by five inches, with no more than one entry per person. Name, address and telephone number of entrant should be indicated on the back of each photograph. Pictures should be mailed directly to Parkway Fabricators, Inc., Dept. PC, 241 Raritan Street, South Amboy, NJ 08879.

To ensure contest consideration, applicable rules and exclusions can be obtained from Parkway dealers.



36 OUT OF 36.



36 beautiful exposures out of 36. Up to now it has been just a dream for even the most skillful underwater photographer. The reason is simple. Bracketing.

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incredibly accurate exposure even under the most demanding conditions. When used with the new Nikonos SB-101 speedlight, you get what every diver has always wanted; magnificent flash exposures with any subject.

The demand is great. The supply is short. But 36 out of 36 is worth waiting for. Write Nikon Inc., Dept. 25, 623 Stewart Ave., Garden City, N.Y. 11530 for details.

NIKONOS IV-A

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circle #113 on Reader Service Card

Tips and Techniques to Improve Your

U/W close-up PHOTOGRAPHY

Text and Photography by Jim and Cathy Church

The purpose of this article is to help you overcome the mechanical hurdles of using U/W close-up systems. We assume that you already have, or know about, close-up lenses, extension tubes or close-focusing SLR lenses.

STRIP TO THE ESSENTIALS

Begin by removing any piece of photo gear that isn't essential for the particular kind of close-up photography you intend to do. With a Nikonos, remove bulky baseplates, extra-large strobe arms, exposure meter mounts and any other accessories that can bump the bottom (or your subjects) and reduce ease of handling. You don't need a large arm and bracket when strobe-to-subject distances are less than 18 inches. You can hold your strobe at almost any angle easily and accurately by hand. To free a hand, simply tuck the strobe under your arm.

For close-up work, many of the smaller strobes can be aimed comfortably without arms or handles. Try placing your hand at the rear of the strobe, with your fingers pointed toward the front. To aim the strobe, point your fingertips at the subject. The larger Oceanic 2001, 2002 and 2003 strobes have a large screw that holds the ball-joint arm to the strobe. Remove the arm, replace the screw, and grasp the screw with your hand. Point along the bottom of the strobe with your first finger, and wrap your thumb and other three fingers around the body of the screw. To aim the strobe, point your first finger at the subject.

Removing arms, bars and brackets, however, depends on the design of your system and how well you can hold the strobe by hand. A simple, adjustable

arm, that allows you to easily position the strobe where you want it, can be a great help. The key idea is to avoid fighting an arm and bracketing system that wasn't designed for close-up work.

USING WANDS

Assume, for example, that you are using a Nikonos with 35 mm lens, a Hydro Photo #2 close-up lens and the Hydro Photo wand. Aim by pointing the camera lens at the subject! Don't point the wand at the center of the subject — the wand is for estimating distance only.

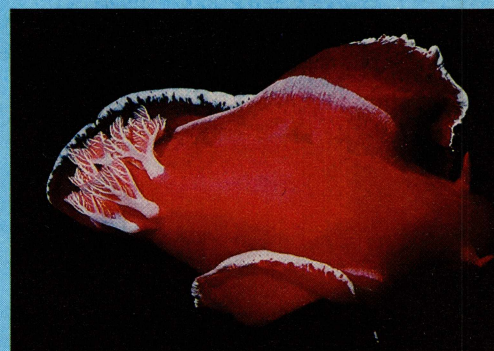
The approximate four by six inch picture area will be centered directly in front of the lens, just below the tip of the wand. Underwater, you can use visual references to help you estimate the size. For example, look at the back of your Nikonos camera body: It is about four by six inches — which is about the size of the picture area.

Touch your first finger to the top of the camera body, and your thumb to the bottom. Without changing the distance between thumb and finger, reach out to a stationary subject. You now have a visual reference to estimate the top and bottom borders of the picture area. Then, place the tip of the wand just above the top border. How far? Look at the camera sideways and see if the wand is bent up or down, relative to the top of the camera body, then position it accordingly.

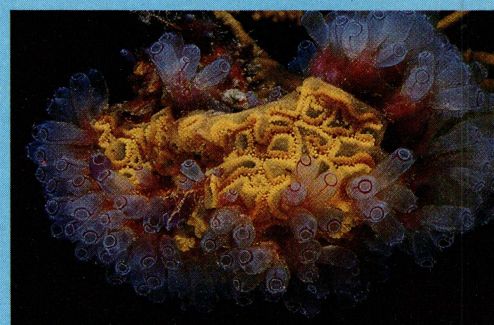
Here's another simple method for estimating where to place the tip of the wand: Touch the center of the lens port with the tip of your thumb, and then reach up and touch the wand with the tip of your first finger. Without changing the distance between thumb and fingertip, move your hand outward so your finger-



Slave strobe bracketed to a lead weight.



Spanish dancer, top and bottom lighting.



Two strobes, from upper left and right.

tip touches the end of the wand. This automatically places the tip of your thumb at the center of the picture area, providing the wand isn't bent. With live subjects that won't tolerate having your fingers close by, you can still look at your fingers for a visual reference.

Photographers with one-eye vision may have trouble placing the tip of the wand over the subject because of impaired depth perception. If so, move your head to one side and get a partial sideview of the tip of the wand to see its position relative to the subject.

When top lighting, hold the camera upside down (or remove the wand) so the wand doesn't cast a shadow on the subject. Likewise, when tilting the camera for



A combination exposure using a single strobe and sunlight. An upward camera angle was used to provide the blue background.

a vertical format, be sure that the wand is on the side opposite the strobe.

Wands can be dangerous. If you lay the camera on its back on the engine cover of a boat, a diver leaning over the cover could impale an eye. We suggest attaching the wand to the camera at the last minute, and removing it as soon as possible after use. Try carrying the wand under the straps of your knife sheath, or under rubber bands wrapped around your strobe.

HYDRO PHOTO FRAMERS

The Hydro Photo framers consist of a pair of stainless steel rods pressed into a plastic ring. The ring fits over the Nikonos lens mount, and the rods show the hori-

zontal picture angle of the close-up lens. The framer for the 35 mm lens shows the exact distance for the HP #1 close-up lens and half the distance for the HP #2. The framer for the Nikonos 28 mm lens also shows half the distance. Longer rods would create too much water resistance.

The main advantage of the twin rods is that they give a better indication of the picture area than a single wand. With side lighting, however, the rods can cause shadows. Beginners usually move the camera in too close with framers that show only half the distance.

When aiming with these framers, keep your eye low and look at your subject just over the top of the camera. If your head is

too high, and you are looking down at the subject, you will tend to aim at the subject's apparent image. And, because the apparent image appears one-fourth closer to your eye, you will aim the camera above the subject's actual position.

NIKON CLOSE-UP KIT

The Nikon Close-up Kit has three main parts: a close-up lens that fits over a Nikonos 35 mm, 28 mm or 80 mm lens; a detachable support rod; and a field framer for each of the Nikonos lenses.

A field framer fits around the perimeter of the close-up picture area. There is a 10 mm (slightly less than one-half inch) space between the framer and the actual borders of the picture area so that the

framer doesn't accidentally show up in the picture. While the framer allows accurate aiming, it can bump against the bottom. Thus, it can't be used when your subject is hiding back inside a small crevice. And, unless a fish is quite tame, you'll have trouble getting it to pose within the field framer. And, angled lighting, of course, can cause the shadow of the framer to fall on the subject.

With the 35 mm and 28 mm framers, begin with stationary subjects and develop an eye for the picture area of the framer. Look for visual references (size of camera back, strobe, etc.) that you can use later. Then, start removing the framer whenever it gets in the way. You might hold the detached framer up to a subject to estimate picture area, and then aim the camera by placing the end of the support rod just under the subject. Finally, after you have a feeling for aiming and picture area, try leaving the framer at home and using the support as a wand. Use your thumb and first finger (as discussed in the section about using wands) to estimate where the center of the picture area will be. And, if the support rod gets in the way, you can always remove it U/W and aim by eye.

After use, wash the Nikonos Close-up Kit thoroughly with fresh water — especially the tightening mechanism that grips the Nikonos lens. Of all the close-up lens systems for the Nikonos, this one is the most susceptible to corrosion.

NOVATEK PLUS/5 FRAMER

The Novatek Plus/5 close-up lens has a non-removable framer that surrounds one-half the picture area. Depending on how you place the close-up lens on the Nikonos lens, either the top or bottom half of the picture is framed. And, for verticals, either the left or right side. The main advantage of this framer is that it gives a better visual reference for the picture area than a simple wand, but doesn't completely surround the picture as do the Nikon framers.

Now for the disadvantages: The lens and framer can be bulky to pack in your luggage, and the framer can bump against the bottom or subjects. Remember, it isn't detachable. After you develop an eye for aiming and picture area, you might consider cutting the framer off and getting a Novatek wand.

AIMING BY EYE

When photographing fish, it is sometimes easier to aim a close-up lens by eye. Try this with the Hydro Photo T3 or 12-28, or the Novatek Plus/2, all of which produce picture areas of about 8 x 12 inches. You may find this technique more

difficult with lenses that produce smaller picture areas.

In the following example, assume that your lens covers an 8 x 12 inch picture area 12 inches from the front of it. You can estimate both camera-to-subject distance and picture area, and can aim your camera with the following techniques:

1. To estimate camera-to-subject distance, begin above water. Hold the camera body against the inside of your forearm, slightly forward of your elbow. Use a ruler to measure the exact camera placement so the front of the close-up lens is exactly 12 inches from the tip of your extended index finger. Remember exactly where the camera touches your arm. Underwater, you can now hold the camera against your arm and reach out with your fingers to estimate distance.

2. Look at the back of the Nikonos camera. The close-up picture area will be about twice as wide and twice as high.

3. To aim the camera, use the empty accessory shoe (for a viewfinder) as a "gun sight." Aim by looking through the shoe, directly over the top of the camera. Aim a couple inches above the intended center of the picture area to allow for the parallax between the shoe and the center of the lens. For example, when taking a fish portrait, you can often aim for the dorsal fin to center the fish's body vertically in the picture. And, as discussed in the section about using wands, don't look down at your subject while aiming, or you will aim at the fish's apparent position.

EXTENSION TUBE FRAMERS

At first glance, extension tube framers appear to be a foolproof method for aiming the camera. But, we've found the following problems to be common:

1. The framer-to-subject distance may be inaccurate. If adjustable, the framer may have slipped. If non-adjustable, the distance may have been set wrong at the factory. The result will be blurred pictures.

2. The picture area indicated by the framer isn't accurate. The framer may be bent, or could have been designed incorrectly. The result will be poorly-centered subjects.

3. You have the wrong framer. If you have more than one extension tube, you may have used the wrong framer. Or, the salesperson may have sold you the wrong framer when you bought the tube. The result will be grossly out-of-focus pictures.

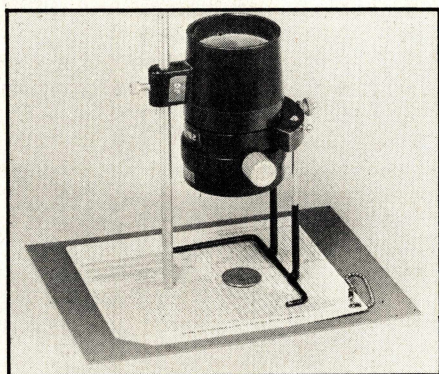
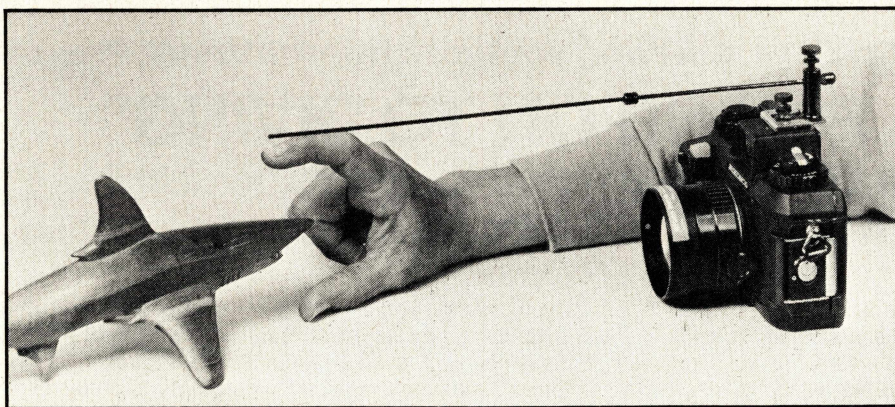
To test for framer accuracy (problems 1, 2 & 3 above) you can use a Nikonos Lens Focuser (\$24, from Aqua-Craft:

7992 Miramar Rd., San Diego, CA 92126). The focuser is a plastic tube with a frosted-finish plastic screen inside. You (a) slip the focuser over the rear of the extension tube, (b) attach the lens to the front of the extension tube, and then (c) lower the framer and lens into a pan of water. Now, you look at the frosted screen and will see the image of a target (we use a dive table) at the bottom of the pan. Because you are actually looking through the Nikonos lens, you see sharpness of focus as well as the exact borders of the picture area in relation to the area within the framer. Note: If you can replace the plastic screen of the focuser with a piece of frosted optical glass, the image will be sharper.

If you don't have a focuser, take U/W test pictures with a dive table and coins as a test subject. Test pictures to determine focus will be more accurate if you open the lens to its widest aperture to minimize depth of field. Use coins to vary the distance of the framer from the table. Photograph the table with two, one and no coins between the framer and the table. Then, photograph with the framer flush against the table with one, and then two coins stacked within the picture area. Keep notes so you can determine the point of sharpest focus. Also, carefully note the exact borders shown within the framer when you take the pictures, and compare these to the borders of your test pictures.

You can take test pictures with sunlight exposures on black and white film. Take a meter reading from the subject and then choose a film that allows you to use your widest aperture for the exposure. The negatives don't need to be printed — just examine them with a magnifying loupe. You can take the test pictures on the steps of a swimming pool or in a large container of water. Set the aperture wide open and control exposure by bracketing with shutter speeds. Because extension tubes affect the amount of light reaching the film, you must add two stops more light than a handheld exposure meter indicates when testing with a 1:1 tube. A one-stop increase is accurate enough for a 1:2 or 1:3 tube. Note: the exposure meter is for a sunlight test exposure only; normally, you take extension tube pictures with color film and strobe lighting.

4. Getting back to the list of problems, poor technique could be the cause of blurred or poorly-framed pictures. For sharpness, use f22 to maximize depth of field (which is only about ¾ inch with a 1:3 tube, ⅝ inch with a 1:2, and 3/16 inch with a 1:1). Keep your main subject in a flat plane to the framer, within the shallow zone of depth of field. Also, don't use the



Above, use your thumb and first finger to estimate the height of the picture area with stationary subjects. Left, the Nikonos Lens Focuser on an extension tube.

framer to fend yourself off the bottom — a bent framer can upset both focus and framing.

5. Spring uprights can bend into the picture area. If your tube has these, we suggest replacing them with solid uprights.

6. The left upright causes a shadow when you sidelight from the left. To eliminate this shadow, saw the left upright off about a quarter-inch above the bottom of the framer. Removable uprights, of course, can be unscrewed, but leaving a quarter-inch helps you determine the left border of the picture area.

7. Supports that merge into a V where they attach to the framer may reflect light back to the lens. If you have small "mystery flare spots" on your slides, apply a dab of flat (non-glossy) black paint to the V-joint, or mask it with non-reflective black tape.

SLR FOCUSING

Focusing an SLR camera can be frustrating. But if you standardize your procedures, focusing will become much easier. Try this three step method of focusing with a 50 mm or 55 mm micro lens:

1. Begin with the lens cranked out for minimum focus. A glance at the lens is all you need — you can see if it is physically extended. Aim the camera and turn the

focus control knob as you shift focus out to your subject. By beginning at minimum focus, you don't have to make a decision as to which way to turn the focus control knob. If you start at a random position, you don't know which way to turn it; and if you turn the knob too fast, you can move past the point of sharp focus without knowing it!

2. Once you have the approximate focus, look at the viewfinder screen from corner to corner. When focusing, you are often so intent on the image at the center of the screen that you don't fill the entire picture area with the subject. Look at the entire screen — if the subject appears too small, move in closer and refocus.

3. When satisfied with the composition, fine focus by moving the camera forward and backward a few inches. This frees your left hand for bracing on the bottom or adjusting your strobe arm.

The size of your viewfinder is a key factor. When the camera is inside a housing, and your face is behind a mask, a normal-sized viewfinder for a 35 mm camera may be difficult to see. Only the center area will be visible, so you must shift your eye to see the corners. And, when you can't see the entire picture area at one time, it's difficult to compose effectively. Therefore, we recommend the over-sized Action Finder for the Nikon F series of cameras, and the Speed Finder with the Canon F-1.

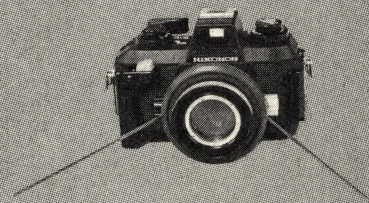
Dim light makes focusing difficult. A dive buddy who will hold a dive light to illuminate your subjects while you focus is worth his or her weight in gold. Or, you might attach a light to your camera housing, strobe arm or strobe. Both the Ikelite Substrobes, 75 and 150, and the Subsea Mark 225 have built-in lights that can be used for focusing and aiming the strobes. >

WANDS AND FRAMERS

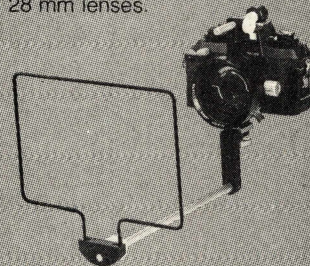
The tip of the wand is placed over the top of the picture area. Wands, such as the Hydro Photo wand shown, are adjustable for distance.



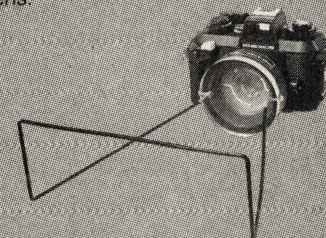
Hydro Photo framers show the horizontal picture angle of the lens. The 35 mm framer shows the exact distance for the HP#1 and half the distance for the HP#2. The 28 mm framers show half the distance for the 12-28 C/U lens for the Nikonos 28 mm lens.



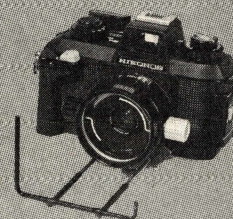
Nikon field framers surround the picture area with slightly less than one-half inch clearance between the border of the picture area and the framer. Separate framers are used for the 80 mm, 35 mm and 28 mm lenses.



Novatek Plus/5 framers surround either the top half of the picture area (as shown) or the bottom half, depending on how the close-up lens is attached to the Nikonos lens.



If you saw the left upright off of an extension tube framer, about one-quarter inch from the bottom, you can side light from the left without causing shadows on the subject.



The PADI Training Facilities & Diving Ventures International Present

"TURN A FRIEND ON TO DIVING" SWEEPSTAKES

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First, locate the nearest PADI Training Facility (see list for participating stores). Take a non-diver friend into the facility and introduce him or her to the courteous staff. You will each receive a free gift PADI's exciting "Turn On To Scuba" bumper decal — and a Sweepstakes registration coupon. Just fill out the coupon and return it to the issuing facility, and you will become eligible for hundreds of prizes! Each time you take a new non-diver into the participating facility, you get another coupon, and another oppor-

tunity to win. Hurry — the Sweepstakes ends June 15, 1982. Don't miss your chance — win big in PADI's "Turn A Friend On To Diving" Sweepstakes!

The official drawing will be held July 15, 1982. Only fully completed coupons will be honored. The promotion may not be available in some areas. Void where prohibited by law. No purchase necessary.

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Professional Ski N Scuba, Inc.
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(501) 862-0021
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(209) 577-DIVE
Aquatic Center
Newport Beach
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5 Cassotta Diving Inc.
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(415) 965-2241
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Fremont
(415) 753-3515
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Orbit Marine Sport Center
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Big Pine Key Reef Park
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Capt. State's Atlantis Dive
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Hal Watts' Watersports
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5 American Dive Hawaii, Inc.
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Dive Maui
Lahaina
(808) 661-0551
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Kailua-Kona
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Aiea
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Ocean Sports Hawaii, Inc.
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- ILLINOIS**
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Elmer's Watersports, Inc.
Evanston
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3 Midwest Scuba Center Ltd.
* Champaign
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Pope's Diving Supply
Sauk Village
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Prospect Dive Shop
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* Indianapolis
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5 Midwest Scuba Center, Inc.
* Indianapolis
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- IOWA**
Chris' Water World
Spencer
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- KENTUCKY**
Underwater Odyssey
Owensboro
(502) 685-3483
- LOUISIANA**
5 Adventure Sports, Inc.
* Shreveport
(318) 425-5870
Aqua Center
Bossier City
(318) 742-6481
4 Aquatic Dive Shop
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Lafayette
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Siddell Dive Center
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(207) 989-4330
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5 Dynamo, Inc.
* College Park
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The Scuba Hut, Inc.
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Don's Dive Shop & Equip. Co.
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Macomb Dive Shop, Ltd.
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Pontiac
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* Royal Oak
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Sport Market U/W Systems
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Wolf's Diver Supply
St. Joseph
(616) 983-1008
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Lake Superior Divers Supply
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Virginia
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Minneapolis
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(919) 292-8260
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(601) 374-3483
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* St. Louis
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The Dive Shop
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(816) 436-5448
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Winchester
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Sub Aquatics, Inc.
Northfield
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5 Treasure Cove Scuba
* Niles
(216) 545-4561
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Ogallala
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- NEVADA**
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Reno
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Newbury
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Divers Unlimited
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The Dive Shop of NJ
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Sub Ocean Services, Inc.
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- NEW YORK**
5 Atlantic II
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Manhasset
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- 5 Skin Diving School of W.N.Y.**
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Underwater Analytical
Accommodations
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5 Westchester Dive Center
* Port Chester
(914) 237-2685
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Scuba Shack Inc.
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5 Diver's Paradise
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(419) 535-6828
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Williamsport
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Harrisburg Scuba Center
Harrisburg
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Jolly Roger Dive Shop, Inc.
Richland
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Smoker's Divers Den
Lancaster
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Jersey Shore
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- 5 York Skin Divers' Supply Inc.**
York
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5 Palmetto Scuba
* Beaufort
(803) 524-7649
5 Underwater Works Limited
* Columbia
(803) 787-8222
5 Waterway Dvg. Schl. & Supp. Inc.
* Columbia
(803) 787-8222
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Underwater Sports, Inc.
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Aqua Center
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Waunakee
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5 The Deep End Scuba Trng. Ctr.
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Hales Corners
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5 Fontana II
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5 Little Devils Scuba Shop
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Dania
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BOINAIRE/NETHERLAND ANTILLES
Captain Don's Habibi
Bonaire, Netherlands Antilles
8290

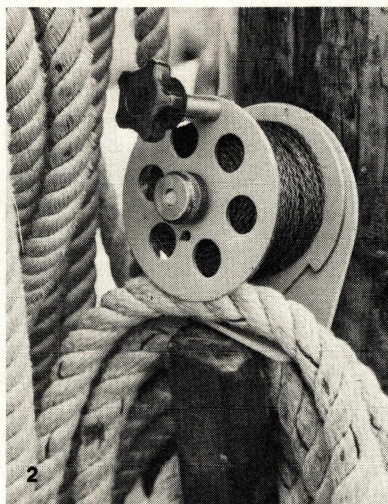
NEW ZEALAND
Russ's Dive Shop, Ltd.
Hamilton
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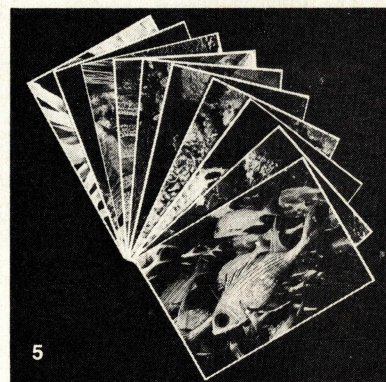
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4 Dive Tables—The color-coded PADI Dive Tables are now available in credit card size (3 1/2 x 2 1/8 inches). The reduced size allows the tables to fit into a wallet or logbook for easy reference. As with the larger size, the tables are waterproof and durable. \$1.25. From PADI, 1243 E. Warner Ave., Santa Ana, CA 92705.

5 Aquatic Art Cards—These excellent reproductions are available in 12 U/W scenes. Measuring 5 x 7 inches, they are perfect for mailing or framing. Each card includes the scientific and common name of the animal shown. 50¢ each or a set of 12 for \$5. From Aquatic Eye, Inc., 111 Woodcliff Rd., Brookline, MA 02167.
(Continued on Page 41)

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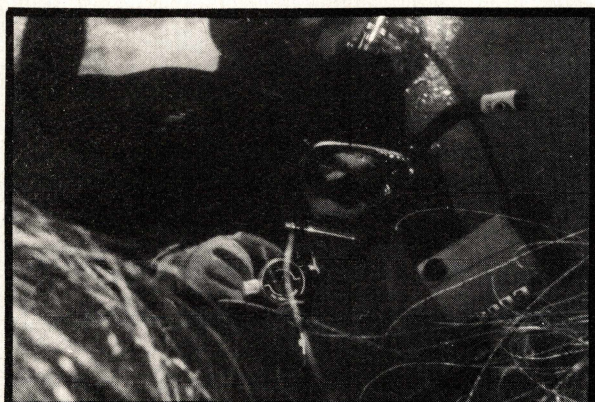
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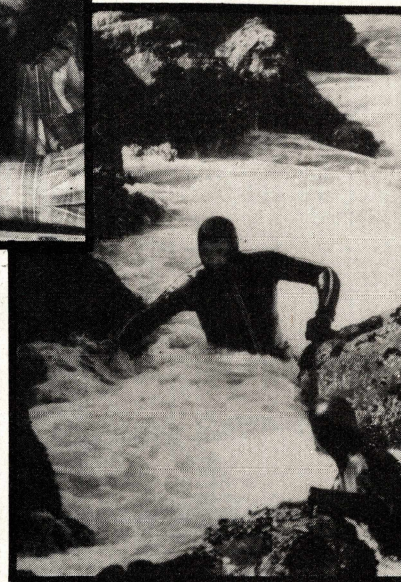


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Photography by James B. Beckett

Dacor's Reuter Tables

quick and easy—
no calculations

BY BONNIE J. CARDONE

Ask any diver, old or new, what the most confusing aspect of scuba is and you are likely to receive this answer: "The repetitive dive tables!" If they weren't an absolute necessity, most of us would prefer to ignore them. Many of us have thought, as did Harold Reuter, "There must be a better way." Unlike most of us, however, Dr. Reuter decided to do something about the problem. The result of his efforts are the No Calculation Dive Tables printed on this page. Introduced at an IQ in 1971, they require no calculations for up to two repetitive dives and only simple addition for three or more. Simplified, reorganized versions of the U.S. Navy No Decompression Repetitive Dive Tables, all three are on one side of a card, with color columns, arrows, lines and broken lines as directional aids. On the other side are the U.S. Navy Standard Air Decompression Tables, instructions for using all of the tables and a handy, erasable chart for keeping track of your bottom time, depth, surface interval, etc.

S. Harold Reuter graduated in 1959 from Harvard Medical School. At present he is an associate professor of Otolaryngology at both the Baylor College of Medicine and the University of Texas Medical School. He also has a private practice in ear, nose and throat. A certified diver since 1966, he is also an accomplished underwater photographer.

The Reuter (pronounced root-er) tables are easy to use. Skeptical? Let's work a complicated, three dive problem: Two California div-

TABLE 1-11 (1-6) No Decompression Limits and Repetitive Group Designation Table for No Decompression Air Dives
U.S. Navy Dive Tables Modified for the Sport Diver

Depth (feet)	10	15	20	25	30	35	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180	190
No Decompression Limits (min)	310	200	100	60	50	40	30	25	20	15	10	10	5	5	5	5	5	5	5	5	5	5
A	60	35	25	20	15	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
B	120	70	50	35	30	15	15	10	5	5	5	5	5	5	5	5	5	5	5	5	5	5
C	210	110	75	55	45	25	25	15	15	10	10	7	5	5	5	5	5	5	5	5	5	5
D	300	160	100	75	60	40	30	25	20	15	15	12	10	10	8	7	5	5	5	5	5	5
E	225	135	100	75	50	40	30	25	20	15	15	13	12	10	10	10	10	10	10	10	10	10
F	350	180	125	95	60	50	40	30	25	20	20	15	15	15	15	15	15	15	15	15	15	15
G	240	160	120	80	70	50	40	35	30	25	22	20	20	20	20	20	20	20	20	20	20	20
H	325	195	145	100	80	60	50	40	35	30	25	25	25	25	25	25	25	25	25	25	25	25
I	245	170	120	100	70	55	45	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40
J	315	205	140	110	80	60	50	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40
K	250	160	130	90	80	60	50	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40
L	310	190	150	100	80	60	50	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40
M	220	170	120	100	80	60	50	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40
N	270	200	140	110	80	60	50	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40
O	310	200	140	110	80	60	50	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40

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MODEL PNT
Dacor Corp
Northfield, Ill., 60093 U.S.A.



BLACK NUMBERS are "Residual Nitrogen Times", time in minutes that a diver is to consider that he has already spent on the bottom when he starts a Repetitive Dive.
WHITE NUMBERS are bottom time limits in minutes for No Decompression Dives.
Printed in U.S.A.

"NO CALCULATION DIVE TABLES" Simplified Linear System for Repetitive Scuba Dives

TABLE 1-12 (1-7) SURFACE INTERVAL CREDIT TABLE

Depth (feet)	10	15	20	25	30	35	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180	190
A	7	6	5	4	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
B	13	12	11	10	9	8	7	6	5	4	3	3	3	3	3	3	3	3	3	3	3	3
C	25	21	17	15	13	11	10	9	8	7	6	5	4	3	3	3	3	3	3	3	3	3
D	37	29	24	20	18	16	14	13	11	10	9	8	7	6	5	4	3	3	3	3	3	3
E	49	38	30	26	23	20	18	16	15	13	12	11	10	10	10	10	10	10	10	10	10	10
F	61	47	36	31	28	24	22	20	18	16	15	14	13	13	13	13	13	13	13	13	13	13
G	73	56	44	37	32	29	26	24	21	19	18	17	16	15	14	13	13	13	13	13	13	13
H	87	66	52	43	38	33	30	27	25	22	20	19	18	17	16	15	14	13	13	13	13	13
I	101	76	61	50	43	38	33	30	27	25	22	20	19	18	17	16	15	14	13	13	13	13
J	116	87	70	57	46	40	36	34	32	28	26	24	23	22	21	20	19	18	17	16	15	14
K	131	101	82	67	54	46	40	36	34	32	28	26	24	23	22	21	20	19	18	17	16	15
L	146	116	94	77	62	51	43	38	33	30	27	25	22	20	19	18	17	16	15	14	13	13
M	161	126	101	82	67	54	46	40	36	34	32	28	26	24	23	22	21	20	19	18	17	16
N	176	136	109	89	71	57	47	40	36	34	32	28	26	24	23	22	21	20	19	18	17	16
O	191	146	116	94	77	62	51	43	38	33	30	27	25	22	20	19	18	17	16	15	14	13
P	206	156	126	101	82	67	54	46	40	36	34	32	28	26	24	23	22	21	20	19	18	17
Q	221	166	136	109	89	71	57	47	40	36	34	32	28	26	24	23	22	21	20	19	18	17
R	236	176	146	116	94	77	62	51	43	38	33	30	27	25	22	20	19	18	17	16	15	14
S	251	191	156	126	101	82	67	54	46	40	36	34	32	28	26	24	23	22	21	20	19	18
T	266	206	166	136	109	89	71	57	47	40	36	34	32	28	26	24	23	22	21	20	19	18
U	281	221	176	146	116	94	77	62	51	43	38	33	30	27	25	22	20	19	18	17	16	15
V	296	236	186	156	126	101	82	67	54	46	40	36	34	32	28	26	24	23	22	21	20	19
W	311	251	196	166	136	109	89	71	57	47	40	36	34	32	28	26	24	23	22	21	20	19
X	326	266	206	176	146	116	94	77	62	51	43	38	33	30	27	25	22	20	19	18	17	16
Y	341	281	216	186	156	126	101	82	67	54	46	40	36	34	32	28	26	24	23	22	21	20
Z	356	296	226	196	166	136	109	89	71	57	47	40	36	34	32	28	26	24	23	22	21	20

SIMPLIFIED REPETITIVE DIVE TABLE
1-13 (1-8)

**TABLE 1-10 (1-5) U.S. NAVY
Standard Air Decompression Table.
(Simplified for the Sport Diver)**

Depth (feet)	Bottom Time (min)	Decom- pression stops (min) 20 (ft) 10 (ft)	Repeti- tive Group
40	200	0	(*)
	210	2	N
	230	7	N
50	100	0	(*)
	110	3	L
	120	5	M
	140	10	M
	160	21	N
60	60	0	(*)
	70	2	K
	80	7	L
	100	14	M
	120	26	N
70	140	39	O
	50	0	(*)
	60	8	K
	70	14	L
	80	18	M
	90	23	N
	100	33	N
80	110	2	41
	120	4	47
	130	6	52
	40	0	(*)
	50	10	K
90	60	17	L
	70	23	M
	80	2	31
	90	7	39
	100	11	46
100	110	13	53
	30	0	(*)
	40	7	J
	50	18	M
	60	25	N
110	70	7	30
	80	13	40
	90	18	48
	25	0	(*)
	30	3	I
120	40	15	K
	50	2	24
	60	9	28
	70	17	39
	20	0	(*)
130	25	3	H
	30	7	J
	40	2	21
	50	8	26
	60	18	36
140	15	0	(*)
	20	2	H
	25	6	I
	30	14	J
	40	5	25
150	50	15	31
	10	0	(*)
	15	1	F
	20	4	H
	25	10	J
160	30	3	18
	40	10	25
	10	0	(*)
	15	2	G
	20	6	I
170	25	2	14
	30	5	21
	5	0	(*)
	10	1	C
	15	3	E
180	20	7	G
	25	4	H
	30	8	K
	5	0	(*)
	10	1	D
190	15	4	F
	20	11	H
	25	20	K
	5	0	(*)
	10	2	D
200	15	5	F
	20	15	J
	5	0	(*)
	10	3	F
	15	6	I
210	20	1	4
	25	3	11
	30	7	20
	5	0	(*)
	10	2	F
220	15	5	F
	20	15	J
	5	0	(*)
	10	3	F
	15	6	I
230	20	1	4
	25	3	11
	30	7	20
	5	0	(*)
	10	2	F
240	15	5	F
	20	15	J
	5	0	(*)
	10	3	F
	15	6	I
250	20	1	4
	25	3	11
	30	7	20
	5	0	(*)
	10	2	F
260	15	5	F
	20	15	J
	5	0	(*)
	10	3	F
	15	6	I
270	20	1	4
	25	3	11
	30	7	20
	5	0	(*)
	10	2	F
280	15	5	F
	20	15	J
	5	0	(*)
	10	3	F
	15	6	I
290	20	1	4
	25	3	11
	30	7	20
	5	0	(*)
	10	2	F
300	15	5	F
	20	15	J
	5	0	(*)
	10	3	F
	15	6	I

*See table 1-11 (1-6) for Repetitive Groups in "No Decompression Dives."

MODEL PNT



DACOR CORP.
Northfield, Ill., 60093 U.S.A.

"NO CALCULATION" DIVE TABLES

INSTRUCTIONS FOR USE

- For a "no decompression" dive:
- Find the depth you have dived along the top of Table 1-11.
 - Drop down to the figure which denotes your Bottom Time.
 - Go across to the right to Table 1-12.
 - Follow the arrow upward until you find the time spent out of the water since the last dive (Surface Interval).
 - Go across to the right to find the allowable Bottom Time (white numbers) for the next dive. These are listed under the appropriate depths at the top of each column.
- The Black Numbers are "Residual Nitrogen Times" and are only important for figuring "Decompression" Dives.
- If the "no decompression" limits are exceeded, go to Table 1-10 for Decompression stops and times.
 - If diver's surface interval is less than 10 minutes, add the Bottom Times of the preceding and following dives, use the maximum depth attained and consider the two dives as one.
 - SHORTENED OR OMITTED DECOMPRESSION: If a diver surfaces after a dive and finds he has not adequately decompressed but has no symptoms of decompression sickness, he has a maximum surface interval of 5 minutes to determine what his decompression for the dive should have been, get back in the water and begin the following decompression procedure:
 - Make a stop at 40 ft. for $\frac{1}{4}$ the 10 ft. stop time.
 - Make a stop at 30 ft. for $\frac{1}{2}$ the 10 ft. stop time.
 - Make a stop at 20 ft. for $\frac{1}{2}$ the 10 ft. stop time.
 - Make a stop at 10 ft. for $1\frac{1}{2}$ times the 10 ft. stop time, then surface.

Use of Table 1-10

- All decompression stops are timed in minutes.
- Ascent rate is 60 feet per minute.
- The chest level of the diver should be maintained as close as possible to each decompression depth for the number of minutes listed.
- The time at each stop is the exact time that is spent at that decompression depth.

DEFINITIONS:

- Bottom time (in minutes) starts when the diver leaves the surface and ends only when the diver starts a direct ascent back to the surface.
- Always select the exact or next greater bottom time exposure.
- Depth (in feet) The deepest depth of descent. Always enter the tables on the exact or next greater depth reached.
- Residual Nitrogen Time—Time in minutes that a diver is to consider he has already spent on the bottom when he starts a repetitive dive.
- Surface Interval—Time in hours and minutes actually spent on the surface between dives.
- Repetitive Dive—A dive begun within 12 hours of surfacing from a previous dive.

PLAN YOUR DIVE—DIVE YOUR PLAN

Always carry the Dive Tables on a dive—they may save your life.

DIVE	DEPTH	BOTTOM TIME	ARRIVAL TIME AT SURFACE	DEPARTURE TIME NEXT DIVE
4th				
3rd				
2nd				
1st				

ers make a 20 minute dive to 80 feet at Farnsworth Bank. Then they move their 17 foot boat closer to Catalina Island and anchor in 50 feet of water. An hour after surfacing from the 80 foot dive they are ready to make a second dive. How much bottom time do they have at 50 feet, and, if they move even closer to the island, can they make a third dive in 40 feet?

Enter Table 1-11 (far left) at 80 feet. This is in the top rectangle. The rectangle directly below it shows the no decompression limit for each depth. Read down from 80 to the bottom time, 20. Read directly right, following the line in the yellow column, to E. This is the divers' group designation after the first dive. Follow the arrow after E up in Table 1-12 until the surface interval is located. Our divers were topside for one hour (1:00) which falls in the square marked 0:55/1:57 (55 minutes to one hour: 57 minutes). If you read directly right from this square you will see that after their surface interval, our divers are now D's. At the top of Table 1-13 (far right) the depths from 40 to 190 are listed. Reading down to D from 50 you find two numbers. The top number (29), in black numerals, is the Residual Nitrogen Time (RNT). The bottom number (71), in white numerals, is the Actual Bottom Time (ABT) remaining at that depth. Our D divers have 71 minutes of ABT at 50 feet. A tank of air will last them about 40 minutes at this depth, so they have plenty of time to make a no decompression dive.

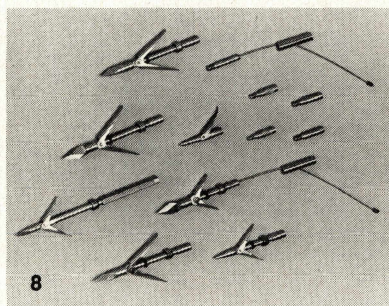
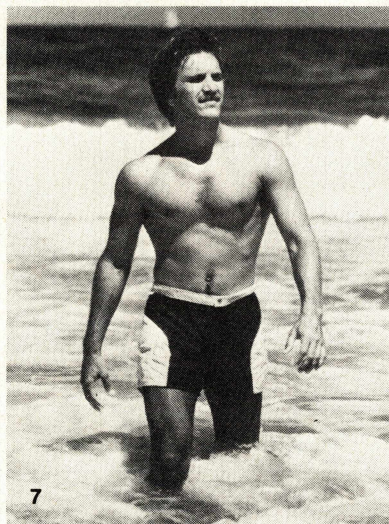
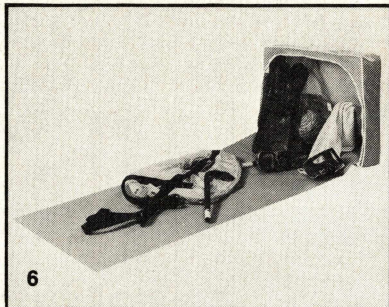
This second dive to 50 feet actually lasts only 30 minutes. Moving the boat into 40 feet of water, our divers have a light lunch and relax in the sun for an hour and 30 minutes (1:30). How much bottom time will they have for their third dive to 40 feet? To determine this you will have to do a calculation for the first time. Enter Table 1-11 at 50 feet and read down to 30, their ABT. You must now add the ABT (30) to the RNT (29) from their previous dive to reach Total Bottom Time (TBT): 30+29=59. Since 59 is between 50 and 60 on the tables, you must use the next greatest time, 60 minutes. Reading right from 60, you will see that our divers are now in group H. Reading up from H to the time spent on the surface (1:30, which falls in the square containing 1:07/1:41) you find that as they prepare to make their third and final dive, our divers are in group F. The no decompression limit for 40 feet, shown in Table 1-11, is 200 minutes. The ABT our divers have as F divers is 139 minutes. (Their RNT is 61.) They know that 139 minutes is more than enough time for a 40 foot dive in 55°F water with a single tank.

Confused? You shouldn't be. If you didn't understand this problem the first time around, read the instructions, study the tables and work the problem again, until you can do it accurately.

Dacor distributes the Reuter tables, which come in three sizes: paper or plastic 9 by 4 inch cards; a 14 by 16 inch plastic card and a three by seven foot wall chart. Check prices and availability at your nearest dive store.

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6 Gear Bag—Divin' and Jivin's #520 gear bag combines ventilation and space with two interior pockets. A large panel unfolds from the bag to form a platform for dressing or gear storage. Large sturdy zippers close this 20x26x5 inch bag. \$59.00. From the Divin' and Jivin' Society, P.O. Box 546, Ocala, Florida 32678.

7 Swimsuit—Featuring eight color combinations and an original new design, these 35% nylon-65% cotton suits have double lock stitched seams. A hook and loop fly secures with a non-corrosive, nickel-plated snap. Pocket closed with a hook and loop flap. \$19.95. From Sun Britches, Inc., 6676 White Dr., West Palm Beach, FL.

8 Spear Points—Mares offers a complete line of high performance stainless steel spear tips. These high quality points include the spring loaded stem point, detachable arrowheads, a tri-cut spinner, and both single and double barb rock points. Adapters fit most guns. From \$7.10. Mares/Sea Quest, Inc., Solana Beach, CA.



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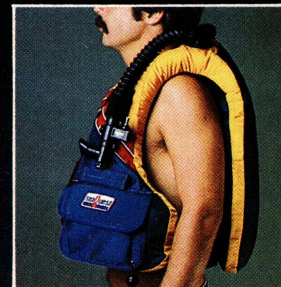
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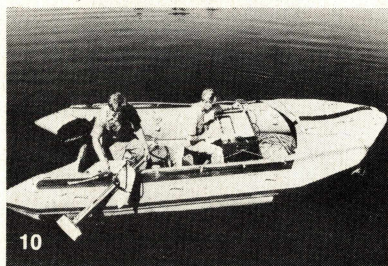
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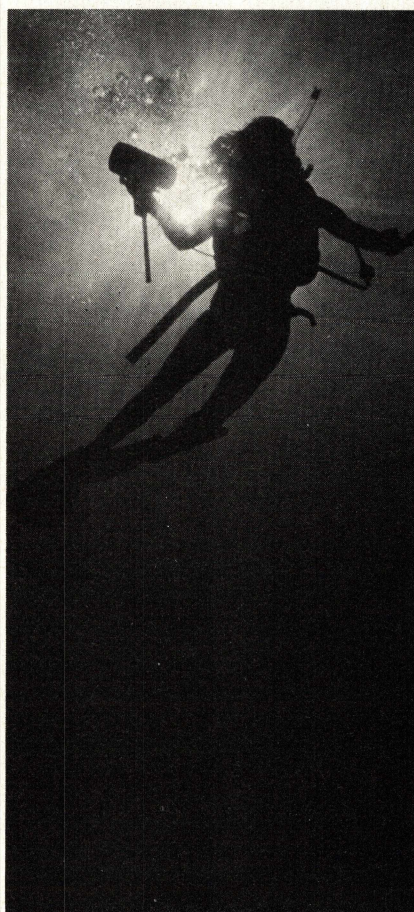
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9 Snorkels—The Crystal series Son of the Gun, and Jet snorkels are made of a clear, hypoallergenic compound. The Son of the Gun model has a smaller bore diameter and a scaled down contour mouthpiece for divers with a smaller bite. Crystal Son of the Gun, \$32. Crystal Jet, \$16. From your Scubapro equipment dealer.

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11 Certification Brochure—The brochure thoroughly, yet concisely, describes this country's first national program for the certification of recreational scuba divers. Individual copies may be obtained from the National YMCA Center for Underwater Activities, Box 1547, Key West, FL 33040, free of charge. Lots of 10, 50¢ each.

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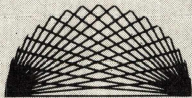
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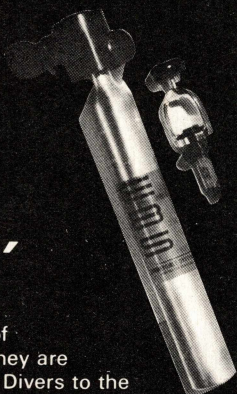
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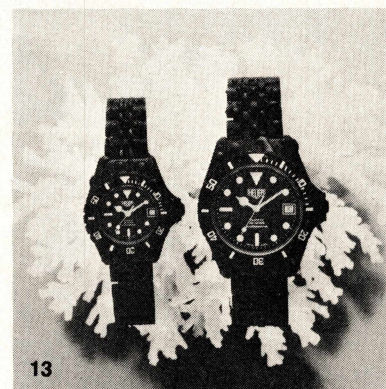
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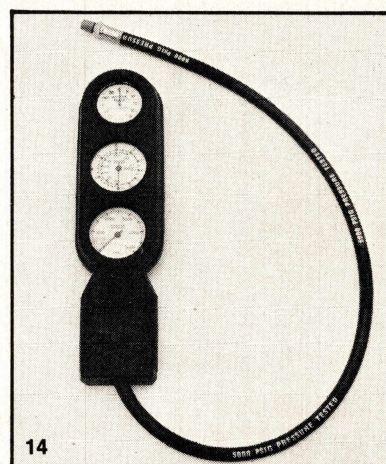
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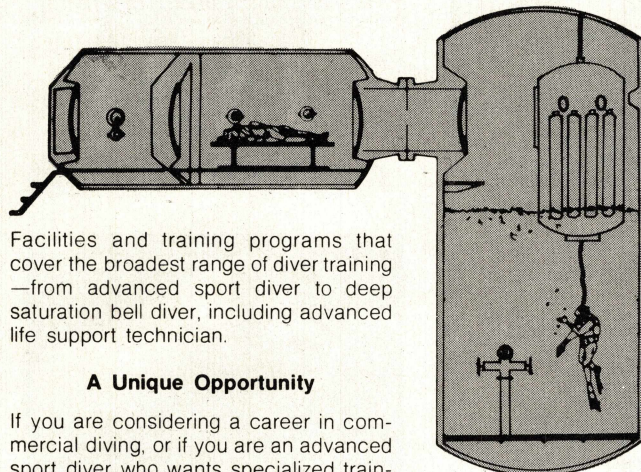


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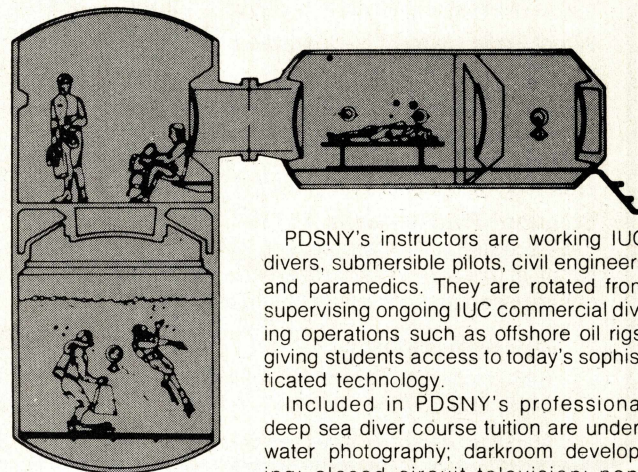
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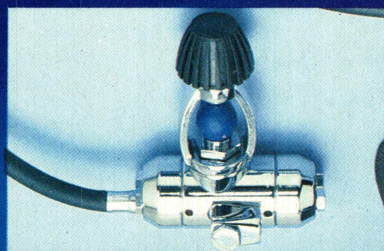
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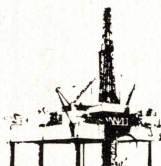
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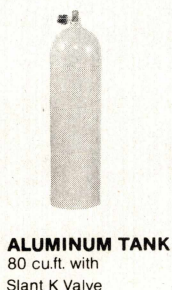
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A new promotional Audio/Visual program is now available from PADI. This slide and cassette tape program helps promote and generate interest in beginning diver courses. It is designed to attract the attention of all age groups at trade shows and other public events.

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Available for only \$34.95, the program also introduces diving specialty areas, explains the benefits of membership in Diving Ventures International and promotes the open water diver certification as only the beginning to a world of adventure.

For information about this economically priced A/V Program (product #60105) contact PADI Headquarters at 1243 E. Warner Ave., Santa Ana, CA 92705; phone (714) 540-PADI (7234).

INDIANA TREASURE HUNT

On Sunday, June 20, Aqua-Nut Divers of Clinton, IN will hold their Annual Treasure Hunt and Membership Drive at Horseshoe Lakes Campground, St. Bernice, IN. This event is one of the largest treasure hunts in the Mid-West. Over \$2500 in prizes have been donated.

Accommodations for out-of-town visitors are available at Horseshoe Lakes Campground and nearby motels. The nearest dive shop is approximately 15 miles south, in Terre Haute, IN.

Divers will be searching for numbered markers in 15 to 35 feet of spring fed waters. The marker number will determine the order of draw for prizes. Every diver participating will be guaranteed at least one prize. No participants will walk away empty-handed. Divers must present certification cards and sign a release of liability form upon registration. Pre-registration is encouraged.

The entry fee for the treasure hunt is \$10 for non-members (\$5 for members), which includes participation in the hunt and all the food you can eat afterward. Divers wishing to join the club that day can take advantage of the \$20 membership drive special which includes: \$10 Treasure Hunt Entry Fee, \$2.50 Horseshoe Lakes gate fee, one free air fill from Ouabache Outfitters, Terre Haute, IN, membership/I.D. card, Aqua-Nut Divers club patch, your name on Aqua-Nut News mailing list, free cook-out at many monthly dives, half-price to many club sponsored events, special club discounts, door prizes at monthly dives. For further information or pre-registration contact: Aqua-Nut Divers, R.R. #1, Box 360, Clinton, IN 47842; telephone (317) 832-9930.



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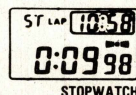
A push of a button sets into motion a fiercely talented stopwatch.

You get 1/100 of a second accuracy, lap times, and up to 59.59 minutes of racing timekeeping. A signal confirms a start and a signal sounds (even underwater) at ten minute intervals during timing. Timing automatically repeats after the hour.

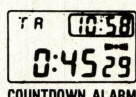
You can also set into motion a 1-minute to 12-hour countdown timer. At ten minute intervals a signal sounds. Upon reaching zero, the timer alerts you with an alarm. And you also get a daily wake-up/appointment alarm and an hourly/half-hourly alarm. Of course, all can be programmed for total silence.



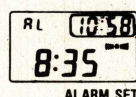
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LW-800

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MAY, West Pacific Branch - Honolulu, Hawaii, weekends Bob Hoffman, 94-366 Pupupani St. #117, Waipahu, HI 96797; (808) 671-0300

MAY, Aquadilla, Puerto Rico - Jaime Vives, Scuba Centro Inc., Ave. Northmain 25-25A-11, Sierra Bayamon, Bayamon, Puerto Rico 00619

* **MAY 8-15, Professional Development Center**

** **MAY 17-24, Professional Development Center**

MAY 22-29, Mid Atlantic - Greenville, North Carolina, Course Director, Gery Putnam, 3760 Rockbridge Rd., Virginia Beach, VA 23455; (804) 460-3178

JUNE, North Atlantic PDC - Weekends at Springfield College, Robert Peck, Project DEEP, P.O. Box 415, Northampton, MA 01061

JUNE WEEKENDS, San Bernardino, Calif. - Susan Bangasser, 12724 Valley View Lane, Redlands, CA 92373; (714) 794-4495

* **JUNE 5-13, Professional Development Center**

JUNE 6-13, Grand Cayman - Contact Glenn Galtere, FLAG (Royal Palms) Underwater Services, P.O. Box 490, Grand Cayman, B.W.I., Phone 92636

JUNE 6-12, North Atlantic PDC - Bridgeport, Conn., Noel Voroba, Orbit Marine Sports, 3273 Fairfield Ave., Bridgeport, Conn. 06605

SUMMER, North Atlantic PDC - Binghamton, N.Y., Larry Marshall, 1123 Ivon Ave., Endicott, N.Y. 13760

SUMMER, North Atlantic PDC - New York City, Walt Hendrick, 348 E. 89th St. (#1-E), New York, N.Y. 10028

** **JUNE 13-20 - Professional Development Center**

JUNE 19-26, Mid Atlantic - Dayton, Ohio, Course Director, Dan Orr, Wright State University, Dayton, OH; (513) 873-3223

JUNE 26-JULY 3, Southwest - Albuquerque/Santa Fe, New Mexico, Bruce Wienke, Los Alamos National Laboratory, Los Alamos, N.M. 87545

JULY, FSU Marine Lab - Tallahassee, FL, Robert Fronk, 7982 Timberlake Dr., West Melbourne, FL 32901

JULY 2-10, Tallahassee, Fla., Bob Fronk and Greg Stanton, 7982 Timberlake Dr., West Melbourne, FL 32901

JULY 2-11, San Diego State University - Mark Flahan, San Diego State University, San Diego, CA 92182; (714) 265-6523

JULY 9-18, San Diego, Calif. - Mark Flahan Center for Marine Studies, SDSU, San Diego, CA 92182; (714) 265-6523

* **JULY 10-17, Professional Development Center**

JULY 10-18, Buffalo, N.Y. - Dallas Edmiston, 39 Garfield St., Lancaster, N.Y. 14086; (714) 681-2932

** **JULY 13-20, Professional Development Center**

AUGUST, Mid Pacific - Santa Cruz, Calif., dates to be announced, Nancy Guarascio, 57021 Snake Rd., Oakland, CA 94611; (415) 482-2326

* **AUG. 7-14, Professional Development Center**

** **AUG. 13-20, Professional Development Center**

AUG. 14-22, North Atlantic PDC - Providence, R.I., Eric Dewhirst, 61 N. Spruce St., East Providence, R.I. 02914

MID-AUGUST, Pacific-South Pacific - Santa Barbara, Calif., Ken Loyst, (714) 296-1758

AUG. 20-29, Southwest - Houston Texas, 22nd anniversary ITC, Steve Golden or Larry Cushman, 5705 Glenmont, Houston, TX 77081; (713) 661-6080

SEPT. 1-OCT. 2, West Pacific Branch - Honolulu, Hawaii, Weekends, Brad Revis, 98-025 Hekaha St., Aiea, HI 96701; (808) 487-9060

* 9547 Valley View Cypress, CA 90630; (714) 761-8348

** (Hall's Diving Center), 1688 Overseas Highway, Marathon, FL Keys 33050; (305) 743-5929

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Rx FOR DIVERS



BY FRED BOVE, M.D., Ph.D.

Since the unexpected death of Charles V. Brown, M.D., last summer, SKIN DIVER has been without an Rx for Divers author. Many readers wrote, requesting that the column be continued: Several very well qualified physicians indicated interest in writing it. SKIN DIVER collected resumes and writing samples and meticulously examined credentials.

Chosen to continue Rx for Divers is Alfred A. Bove, M.D., Ph.D. His credentials are impressive. A graduate of Temple University School of Medicine in Philadelphia, he served on its faculty for eight years. He also served in the U.S. Navy Medical Corps and is a Commander in the Naval Reserves. He became a certified diver in 1965 and, subsequently, both a NAUI and YMCA instructor.

At present Dr. Bove (pronounced boy-vay) is involved in cardiovascular research at the Mayo Clinic in Rochester, Minnesota. He and his wife, Sandra, are the parents of three children -Editor.

DIVING AND BLOOD PRESSURE

Because so many people have blood pressure problems, this question frequently is asked: "Can I dive with high blood pressure?" To understand the problem, it is helpful to know something about pressures in blood vessels.

Blood pressure involves the arteries of the body. These vessels are under pressure, carry blood from the heart to the muscles and organs, and produce what we call a pulse. Because of the high pressure, a cut in an artery bleeds rapidly and in spurts. Normally the pressure in arteries averages about 100 millimeters of mercury (about 20 psi). When you dive, the body maintains the same psi above ambient pressure, so diving does not change the pressure difference across the artery walls, and no changes in the arteries occur.

We normally measure two pressures:

the top and the bottom of the pressure waves (called systolic and diastolic pressures). There are two numbers because the pressure generated by the heart comes in a 40 millimeter pulse wave which rides on a baseline value of about 80 millimeters (80 + 40 = 120, thus normal blood pressure is 120 over 80). High blood pressure occurs when the pulse wave pressure, the baseline pressure, or both are above normal. Blood pressure normally rises with stresses such as fear, excitement and exercise.

How does high blood pressure interact with diving? There are several possibilities:

First: Blood pressure may rise to extremely high values under stress. This can be caused by fear, anxiety, or physical exertion. High pressures occurring from stress can produce severe pounding headaches, dizziness and weakness, and may even bring on symptoms of heart trouble (chest pain) in people with heart abnormalities.

Second: If you are being treated for high blood pressure, you may be taking drugs which block the body's normal responses to stress. These responses are sometimes needed to allow you to perform exercise. If they are blocked by blood pressure medicines and you need to exercise heavily, you may become weak and lightheaded, and your blood pressure can even fall below normal.

Third: If you have had high blood pressure for a long time, you may have damage to the blood vessels of the heart, brain or kidney and abnormal function of these organs may limit your diving.

If you have blood pressure above 145/90, you should be under treatment. It is very likely that your pressure is much higher when exercising and when under other types of stress.

But, can you dive while under treatment: maybe. Many people with mild blood pressure elevation can regain normal pressures by reducing salt in the

diet, frequent exercise and weight loss. If you consume a lot of alcohol, reducing your intake will often work wonders with high blood pressure. When these measures fail, you will probably receive a diuretic tablet to help get rid of salt and excess water from the body and lower blood pressure. If the treatment described so far is successful (that is: diet, exercise, and salt and alcohol restriction, diuretic), the body will work normally during diving and you should experience minimal problems owing to blood pressure. On the other hand, if you require more potent blood pressure medicine — drugs which block the normal control system for blood pressure — then you can experience difficulties in times of stress: Just when you need everything working well to get out of a tight situation.

Let's reiterate: (1) If you have uncontrolled untreated hypertension, you should not be diving. See your physician and get proper treatment. (2) If you had mild hypertension and a combination of weight loss, salt restriction, reduced alcohol intake, exercise, and a diuretic tablet has returned your blood pressure to normal, go to it. (3) If you require medicines which severely block the normal blood pressure responses to stress and exercise, you shouldn't be diving.

If you have high blood pressure, talk to your physician about the different ways you can be treated. Remember that treatment may continue for many years, and the goal is to achieve a normal blood pressure with the least amount of medicine. Treatment is a cooperative effort between you and your doctor. You must decide together when it is safe to dive.

QUESTIONS

Question: Can a person with a history of spontaneous pneumothorax dive?

Answer: Knowledgeable diving physicians would not recommend it because of the increased risk of pneumothorax.

Question: Should a pregnant woman dive?

Answer: Although there is some controversy on this question, we recommend not diving while pregnant to remove any risk to the fetus from oxygen poisoning or decompression sickness.

Question: Why does a diver develop nausea and vomiting while diving?

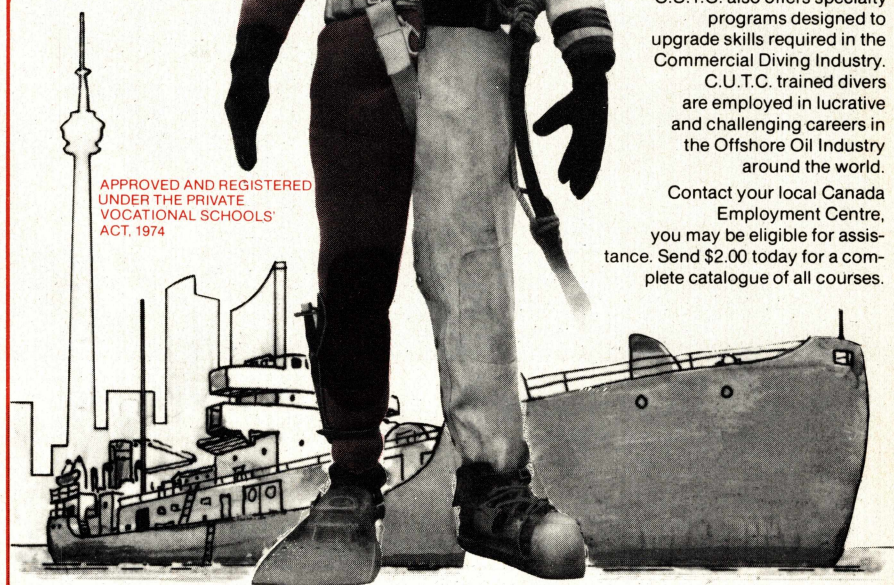
Answer: Eliminating contaminated air, and assuming you were in good health when you began your dive, you are probably seasick.

In assuming the position of medical editor, we hope to provide as much service to you as the late Doctor Brown did so well. In looking at the letters received from July-December 1981, we find many which seem to have lost their relevance. For those who have not received a reply and still need information, please let us know and we will try to provide an answer — Fred Bove.

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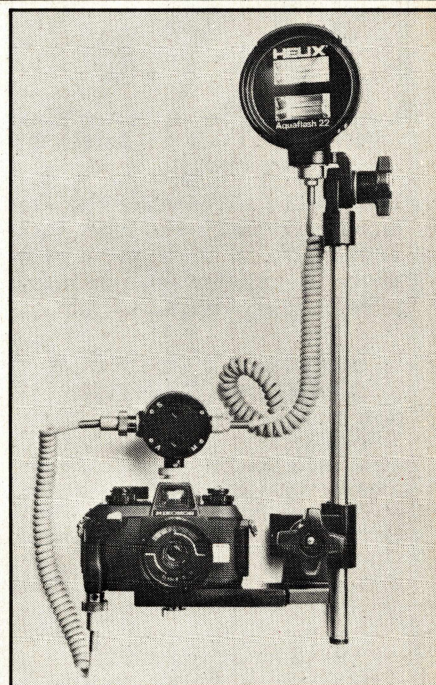
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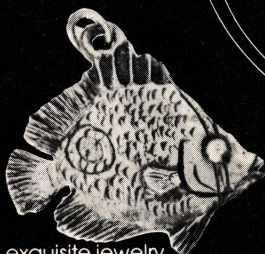
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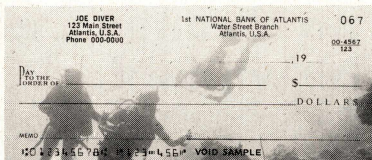


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lake lanier

Georgia Bonanza

BY SCOT SMITH

Lake Lanier is just a short drive north of Atlanta, Georgia. Just the thought of diving here makes some local divers' blood run cold, and that's not all! Most Atlanta divers have had little, if any, exposure to cold water/limited visibility diving and for good reasons. Who wants to dive when you can't see your hand in front of your mask? Who wants to dive when the water is so cold that you need to wear a full wetsuit or drysuit? Just the fact that not many people do, means that there is a virtual bonanza awaiting those stout hearted souls who are willing to brave the inconveniences inherent in this type of diving and give it a try.

The dam is a good place to start. It is mostly earthen, with the hydro-electric facility approximately two-thirds of the way across near the west side. Above the power plant is a convenient parking area with several trails leading down to the water's edge. After gearing up in the parking lot, begin the careful trek down. All trails are unbelievably steep, with loose rocks and boulders everywhere.


The water around the dam is perhaps the clearest to be found on the whole lake. This is because almost all of the suspended matter in the water has had plenty of time to sink to the bottom by the time it gets here. Clear water for Lake Lanier however, does not conjure up visions of tropic islands or the springs! It is reasonably clear though, sometimes reaching the unbelievable clarity of 15 to 20 feet!

As you drop down along the steep incline underwater, the first thing that comes to mind is; Where's the bottom? The deepest area (165 feet) that this diver has ever found in the lake is about one half mile straight out from the dam. That's not to say that there aren't any deeper areas. I have been told by informed sources that there are, but I haven't found them yet. As you proceed down, the size of the boulders used to make the dam is the first thing that astounds you. Some of these giants are 20 feet across and weigh more than 30 tons! Around the large rocks and boulders there is an unusual abundance of curious fish. Some of the larger bass follow you around just as a barracuda would on a tropical reef.

In late summer, the first noticeable thermocline occurs at about 30 feet. After that first thermal shock, most of the

following thermoclines go by unnoticed until you reach the 70 foot range. At this depth you pass from the warmer, better-lit area into the "Twilight Zone." For any close observation of what might be buried just under the silt or what's concealed in that dark nook, a light is mandatory. This area is good for locating any stolen booty or ditched firearms. Criminals not wishing to be caught with the evidence hurl it as hard as they can from the roadway above. Even students on open water training dives have found weapons and goodies here! If you're into fishing and running low on lures, forget going to the tackle shop. There is a smorgasbord of fishing gear here. After passing the 70 foot zone, the dive really begins. The water is so clear it's unbelievable. It's so cold too! The cold water creates weird special effects, reminiscent of looking down a paved road on one of those blistering days: It has waves and ripples. At the 100 foot level, after a surface temperature in the 90's, your thermometer will read approximately 40°F.

Keep in mind that this, like many other types of diving, requires a certain amount of specialty training and should not be attempted by those not physically and mentally prepared. There are demands on the psyche of the diver that are reminiscent of those required for cavern/cave diving. If this type of diving appeals to you, receive specialty training before attempting it and always strive to dive with another having a greater knowledge and greater skills in this area.

Have a nice dive! 


POLARIS/SCUBAPRO

The article on the Polaris 5S, in the March, 1982 SDM contained the following statements:

"Overall, the first stage appears very similar to Scubapro's Mark V first stage. An uncanny resemblance? Not really. The Polaris V is made by the same company that originally made the Mark V for Scubapro (before Scubapro went into its own production on the unit)."

It has been brought to the attention of the article's author, George Cozens, that the last statement is not true.

According to Scubapro authorities, the Mark V first stage is an original Scubapro design. It was conceived in 1965, and first introduced to the public in Scubapro's 1966 catalog. Since the beginning, the Mark V has always been assembled in-house, at Scubapro. At a later time, components were made by European vendors, and assembled at Scubapro's plant in Italy, for distribution to the European market.

It appears that the confusion stems from the fact that one of these European vendors also made components for Cressi-sub. Somehow, with the passage of time and information transmitted by word-of-mouth, the story got misconstrued. 

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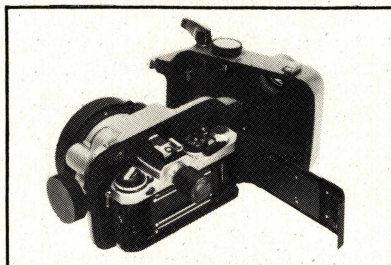
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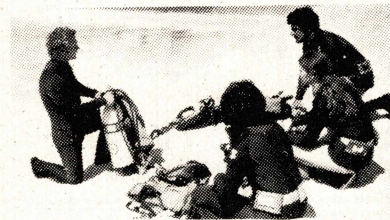
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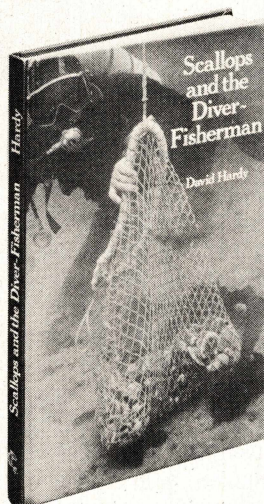
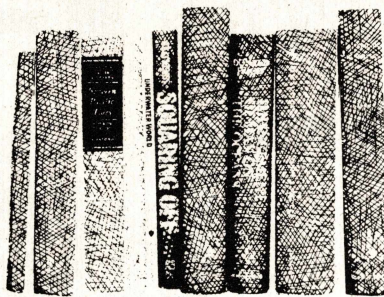
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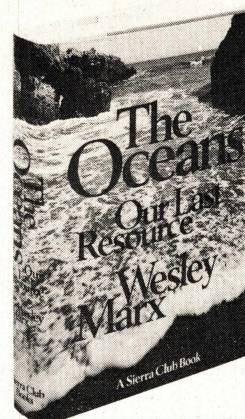
New Books



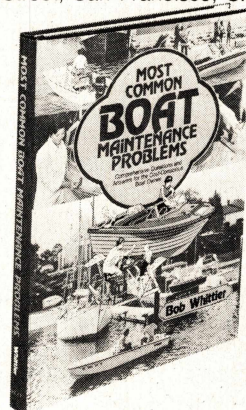
- 1 Scallops and the Diver-Fisherman** — With emphasis on fishing in the British Isles, this book also applies to scallop harvesting worldwide. The ecology and fisheries potential of the scallop is discussed as well as harvesting and diving techniques. L8.50. From Fishing News Books, Ltd., Farnham, Surrey, England.



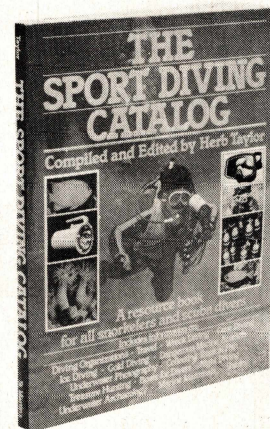
- 2 The Dolphins' Gift** — The true story of a family of wild dolphins that visits a remote Australian beach daily to touch humans. Including some general discussion of dolphin physiology and habits, the author intuitively explores the dolphin-human interaction. \$7.95. Whatever Pub. Co., 158 E. Blithedale, Suite 4, Mill Valley, CA 94941.



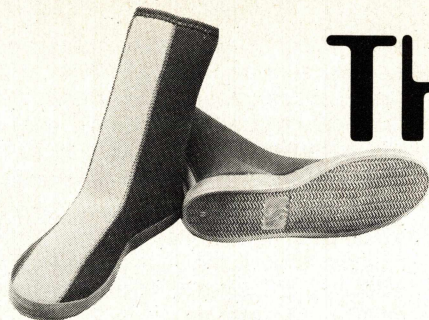
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- 5 The Sport Diving Catalog** — Covering topics like basic equipment, marine life, certifying organizations, specialty diving and travel; this resource gives an overview of sport diving activities at all levels of competence. With many illustrations. \$10.95 in paperback, \$24.95 in cloth. From St. Martin's Press, NY, NY.



THE DELTA FACTOR

Scubapro's Unconventional Boot

BY JIM WALKER

You've come a long way bootie! From sweat socks which held their shape for about half a dive; to homemade, patchwork, rubber nightmares which had to be re-glued nearly every dive; to store-bought, foam neoprene booties (more like socks) which lasted a few dives without the need for major repair; to improved neoprene "socks" with hard rubber soles crudely attached; to, at last, footwear that is comfortable, durable and even good looking. In this last group we find the Delta Boot from Scubapro.

The Delta Boot has left the neoprene sock (with or without sole) far behind. It is *diver's* footwear, not just diving footwear. The difference is that the Delta Boot is functional in or out of a fin.

The body of the Delta is still foam neoprene, but it's an attractive five piece combination of blue and black nylon two. Blue panels run up the front and back of the foot and black panels up the sides.

The fifth panel makes up the interior sole. Not only does this panel structure make the boot attractive, it also allows the boot to be shaped to fit the human foot. This improved fit increases diver comfort and reduces wear on the boots: Scubapro has angled the ankle of the boot back about 25 degrees from vertical. This angle approximates the normal swimming position of the foot. The back of the Delta Boot features an anti-slosh heel pocket. The boot is contoured in the area of the Achilles tendon to fit snugly. This contour or indentation not only stops heel slippage inside the boot, it also helps keep fin straps in place.

All seams of the Delta Boot are sewn inside and out, and joined with a special adhesive which dries softer than conventional glues. All thread ends are covered, either by edge tape or by the sole.

Edge tape surrounds the top of the ankle, protecting the neoprene. This is an important feature as the top of the ankle

takes quite a beating (on all booties) while being stretched over the foot. Unlike some other types of edge taping, this black nylon fabric is extremely stretchy. It won't make putting the boots on a chore.

Probably the most important feature of the Delta Boot is its exterior sole. It's tough, solid neoprene and extends one-half inch up the sides of the boot and is permanently bonded to the boot body. The bottom of the sole has V-tread.

The Delta Boot is available in two styles: The standard model and the long life model. This latter boot has built-in extensions of the sole which cover the toe and heel (areas which receive the most wear). Both models are available in three-sixteenths or one-quarter inch neoprene, in seven sizes from extra small (3-4) to extra extra large (13-14). Delta Boots sell for \$37.50-\$48.00 depending on thickness and style. See your Scubapro dealer. ➤

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The newest and most innovative advanced diver training center in the world has begun operation on City Island, New York. This marks the beginning of comprehensive training classes designed to introduce divers to the techniques and equipment needed for working at depths of 1000 feet for periods as long as five weeks. The North American Hyperbaric Center includes actual saturation exposures in this new multi-chambered facility for students interested in pursuing the most sophisticated of all commercial diving specialties; saturation diving.

Saturation diving has been in the news quite a bit recently. It was this technique that allowed Peter Gimbel and his diver/photographer teams to explore, photograph and reclaim the safe from the ill-fated *Andrea Doria*. On the other side of the North Atlantic, in the cold, dark Barents Sea, divers under the supervision of Keith Jessop worked at 800 feet to remove more than \$80 million in gold from the torpedoed World War II *HMS Edinburgh*.

Treasure hunters and explorers aren't the only ones to use saturation diving techniques. In fact, they are a distinct minority in a group of divers that normally works at great depth. Saturation divers are usually veteran commercial divers whose reasons for being at 500 or 600 feet are as diverse as the field of commercial diving itself: Building, inspecting, monitoring, repairing, testing and exploring. The things for which a commercial diver is needed in 30 feet of water also require his presence in very deep water. There comes a time in every project when remote cameras, mechanical arms and submersibles can't get a particular job done. The job requires the specific talents of a trained underwater technician skilled in welding, troubleshooting, or engineering. With natural resource exploration expanding rapidly and drilling taking place at many points around the world, demand for qualified mixed gas bell divers will certainly increase.

The North American Hyperbaric Center is the advanced training facility for the Professional Diving School of New York. The parent company of the school is International Underwater Contractors; a worldwide organization.

Below 190 feet air-based diving becomes impractical, even for experienced commercial divers. To combat the problems of diving deep on air, mixed gas diving began. To eliminate nitrogen narcosis, helium (an inert gas) was added. This lowers the concentration of nitrogen and drastically reduces the narcotic effect of diving at depth. To eliminate oxygen toxicity, the percentage of oxygen in the mixed gas (nitrogen/helium/oxygen) was reduced so that it

never reaches problem levels.

As a diver begins to descend, the tissues in his body begin to absorb whatever gas mixture he's breathing. The deeper the diver goes the more gas is absorbed. After about 12 hours, the tissues have reached a point where they can't absorb any more gas; they are saturated. The diver can stay down one day or three weeks, the decompression time doesn't significantly change. Saturation diving, or living at depth for long periods of time, provided a method for effective and economical work at great depths.

There are obvious problems with living at great depth. The divers do not spend all of their time on the bottom but commute to work via diving bells and submersibles. They actually live in large chambers that are equipped with living conveniences on board the oil rig or research vessel. When it is time to go to work, the submersible or diving bell is connected to the living chamber, pressure is equalized, and the divers begin the long descent to the job site. Once there, alternating shifts of work begin and the task at hand is tackled. When the shift is over the diving bell is closed and returns to the surface to rejoin the living chamber. On some jobs divers remain at pressure equal to their working depth for periods of four to five weeks. They usually receive an equal amount of time off (month on/month off). The very desirable jobs in saturation diving, as well as commercial diving, go to divers with skills and trades that can only be acquired with experience. Good mechanical ability seems to rank high among the chief qualifications for deep diving work.

At the North American Hyperbaric Center, an entire system of living chambers, diving bells and diving tank, at pressurized depth, have been created. The new 15,000 square foot facility has not one, but two independent chamber complexes capable of saturation simulation. The systems are basically composed of four enormous chambers set in a seven foot thick concrete foundation. The chambers formerly belonged to the Experimental Diving Unit of the U.S. Navy and are so big that the building which houses them was built after the chambers were hoisted into place. The smaller living chamber is 16 feet long and has a diameter of seven feet. This is connected to a vertical chamber 24 feet high and 10 feet in diameter. The diving bell and a water tank where actual diving can take place are in this large chamber. The entire chamber complex can be pressurized to 400 feet.

Before graduating from Professional Diving School of New York's advanced diving training program, the student can expect to have spent seven days in actual saturation and decompression. An

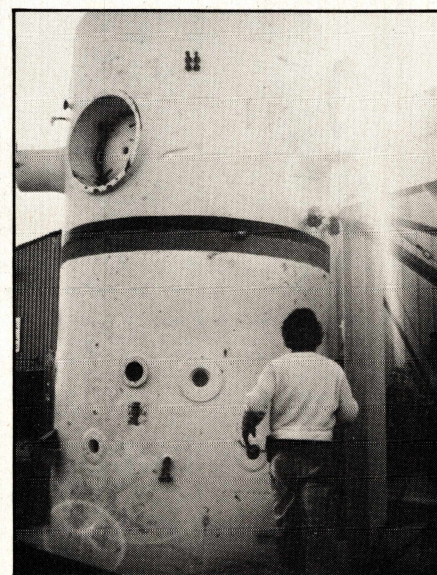
equal amount of time will be spent in surface life support for other divers in the saturation chambers. The areas of instruction include advanced life support and paramedic training as well as instruction in actual chamber operations.

The director of the Hyperbaric Center is Glenn Butler. He has been with International Underwater Contractors as its safety director since 1975 and has an extensive background in hyperbaric research. He was involved in the development of Nitrox and saturation tables for NOAA prior to working for IUC and has been actively involved in the development and patenting of a successful transfer-under-pressure resource system that is utilized in the North Sea.

All dive operations are handled by Gary Parsons, an 18 year veteran of Navy diving with an impressive record as a commercial diver as well. Gary was a pioneer in nuclear reactor diving and has spent more than five years training commercial diving instructors and students. Lee Daversa is the chief instructor at PDSNY and has more than ten years of commercial diving experience including a first class Navy diving rating and saturation qualification.

The affiliation of the North American Hyperbaric Center with International Underwater Contractors has been beneficial to everyone involved. Many of the instructors at the NAHC are working as

Sat



photos/courtesy IUC



SCHOOL

North American Hyperbaric Center Opens Innovative Diver Training

BY BILL GLEASON



Top, the North American Hyperbaric Center is affiliated with International Underwater Contractors, developer of the *Mantis*. **Left**, the huge chambers or tanks at the NAHC can be pressurized to 400 feet.

Above, the two independent chamber complexes were erected before the surrounding building was constructed.

professional divers when not involved with teaching assignments. This close contact with high technology diving ensures that the student will be exposed to the latest advancements in diving. IUC also is an employer of many of the school's graduates at starting salaries of around \$14,000 to \$19,000. According to Glenn Butler, two of the biggest myths about commercial diving are that it is extremely dangerous and that it is very high paying. Glenn stresses that the first few years are training years, and that the salaries, while good, are definitely not in the \$100,000 a year bracket. A very experienced diver doing saturation work can expect to make more than \$500 a day, but the amount of time he's able to work will cut his effective annual income to around \$40,000 to \$45,000 a year. And that's a trained, experienced diver. Commercial diving and saturation diving can

make for a very rewarding career, but you have to be willing to pay your dues. Technology advances have made saturation diving much safer than in the past, and the field of dive medicine is daily adding to its store of hyperbaric information.

The North Sea, the West Coast of Africa, the Persian Gulf, and the Far East are some of the exotic locales professional divers frequent. They also dive on the continental shelf of the U.S. and in the Gulf of Mexico. But most of the traveling and exploring that they do is straight down, at depths down to 1000 feet.

For more information about how saturation divers work and how they get to work, contact Glenn Butler: Professional Diving School of New York, Inc., 222 Fordham Street, City Island, New York 10464; (212) 885-0600. 🐟



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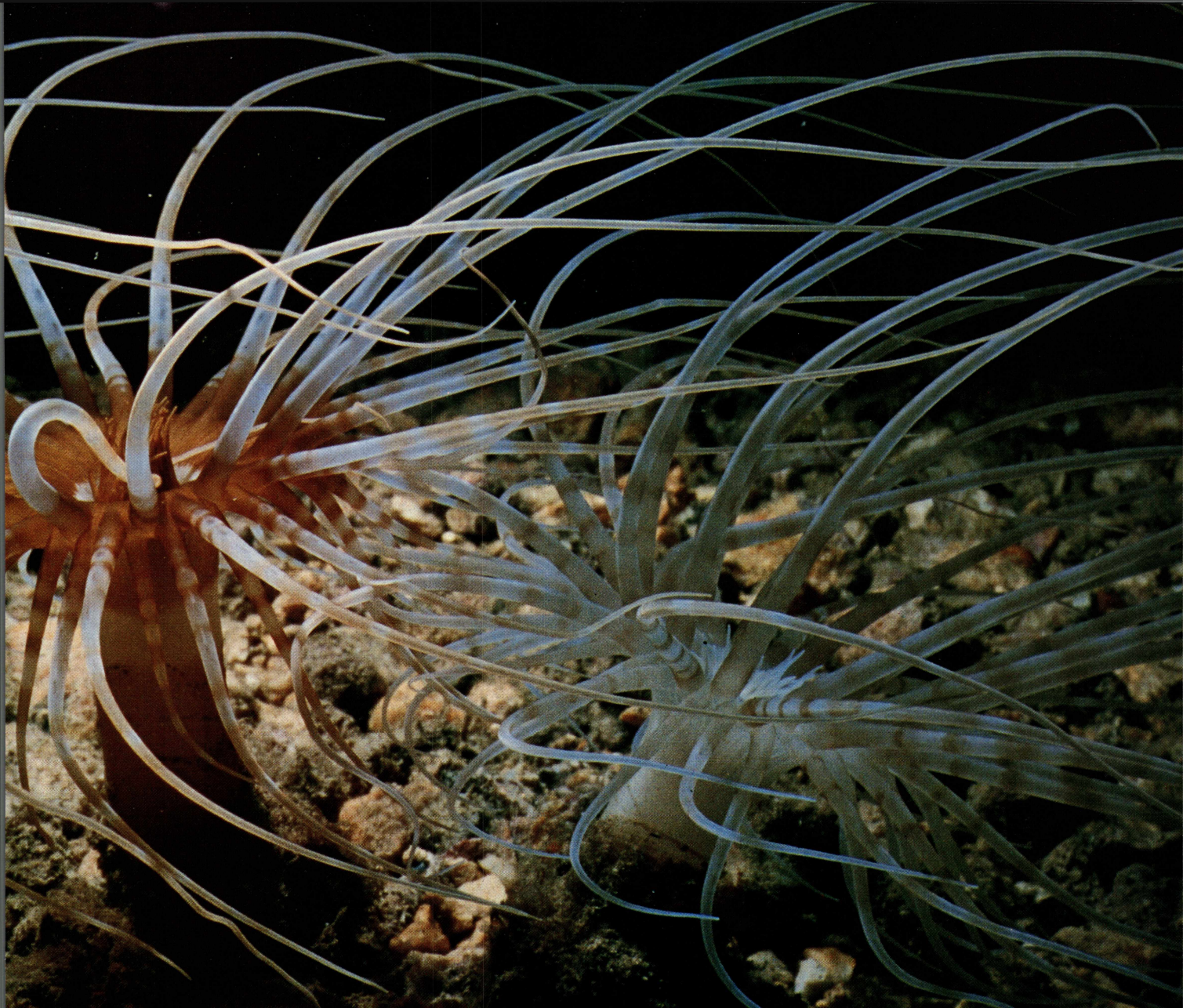
Macro Capital Of The Caribbean

Text and Photography
By Geri Murphy



Many of today's resort diving areas are identified with specific undersea attractions. Grand Cayman is famous for its drop-offs. Riding Rock Inn is renown for its pet groupers. Truk Lagoon has the finest collection of sunken wrecks in the world. Bonaire has had, for many years, a reputation for superb diving right from shore. While this advantage still exists today, there is an undersea attraction far more fascinating and compelling. Bonaire is rapidly becoming known for its small invertebrates and reef fish which are ideally suited for macro photography.

Bonaire is a small island in the Dutch Antilles, 50 miles off the coast of Venezuela. Its shoreline is bordered by fringing coral reefs and steeply angled slopes which begin almost at the beach and drop quickly to an average depth of 110 feet. The waters surrounding Bonaire are very warm and incredibly rich in



nutrients. This combination serves as a fertile incubator for the prolific growth of small marine creatures of every kind.

The western side of Bonaire is completely protected by a boomerang shaped bay and a small offshore island, thus producing calm water and virtually no current. This environment promotes the rapid growth of delicate sponges, anemones and corals of every type. In fact, Bonaire's natural marine environ-

Top left, Donna McLaughlin readies her macro outfit. It includes a Nikonos camera, twin strobes, 1:3 extension tube and framer.

Far left, Chris McLaughlin photographs a sea urchin at Calabas Reef.

Near left, a cup coral extends its bright orange tentacles at night.

Above, the wispy tentacles of a tube anemone drift in a mild current.

ment is a fast breeder for just about every invertebrate and small reef fish found in this part of the Caribbean.

SHORE SITES FOR MACRO

Calabas Reef is directly out from the Flamingo Beach Hotel and can be dived from one of three different hotel piers. The slope starts about 50 yards from shore in 25 feet of water. The top of the slope is like a garden filled with purple-tipped and green-tipped anemones. Every anemone serves as host for shrimp which are perfect for 1:2 macro.

Often seen in the same area are several species of snake eels, including the goldspotted eel and the sharptail eel. Shooting a portrait of this eel's face is best done with a 1:2 macro tube.

At a depth of 30 to 40 feet, photographers will find a number of black and white spotted morays. These eels are small in size and make good subjects for

the 1:3 macro tube. Also on this same reef are a number of tame fish including yellowtail snapper, Spanish hogfish and bluehead wrasse. These fish can be enticed into a 1:3 framer with small scraps of bacon, ham or other breakfast leftovers. At the north end of the reef, in 60 feet of water, is a sunken metal lifeboat. It is overgrown with patches of red sponge and yellow *Tubastrea* corals.

Town Pier offers a variety of macro creatures which will keep the photographer busy for hours. The pier pilings are virtually covered with Christmas tree worms. There are literally thousands of these tube worms, in every color, growing on every piling. Clustered around the base of the pilings are many arrowcrabs. These spider-like crustaceans range in size from two to five inches and are ideal subjects for the 1:3 macro tube.

Among the debris on the bottom you will often find a colorful scorpionfish.

These creatures are unafraid of divers and will let you approach within inches with a 1:3 framer. There are several octopuses which live inside of pipes or hollow tubes lying on the bottom. Unfortunately, these shy creatures rarely come out in the open and are difficult to photograph.

The debris beneath the pier provides an ideal hiding place for a family of crimson red brittle stars. These creatures are especially vibrant in color and produce stunning photos with a 1:3 macro tube.

Because of the boat traffic which moves in and out at the town pier at all hours of the day and night, it is necessary to get permission from the Harbour Master to dive there. You should acquire a permit 24 hours in advance by going to

the Harbour Master's office and signing the necessary form.

Porch Reef is directly out from the Hotel Bonaire and is one of the oldest and best known shore dives on Bonaire. It was originally developed by Captain Don Stewart more than ten years ago. This slope begins 30 yards from shore and slants quickly from 30 to 110 feet.

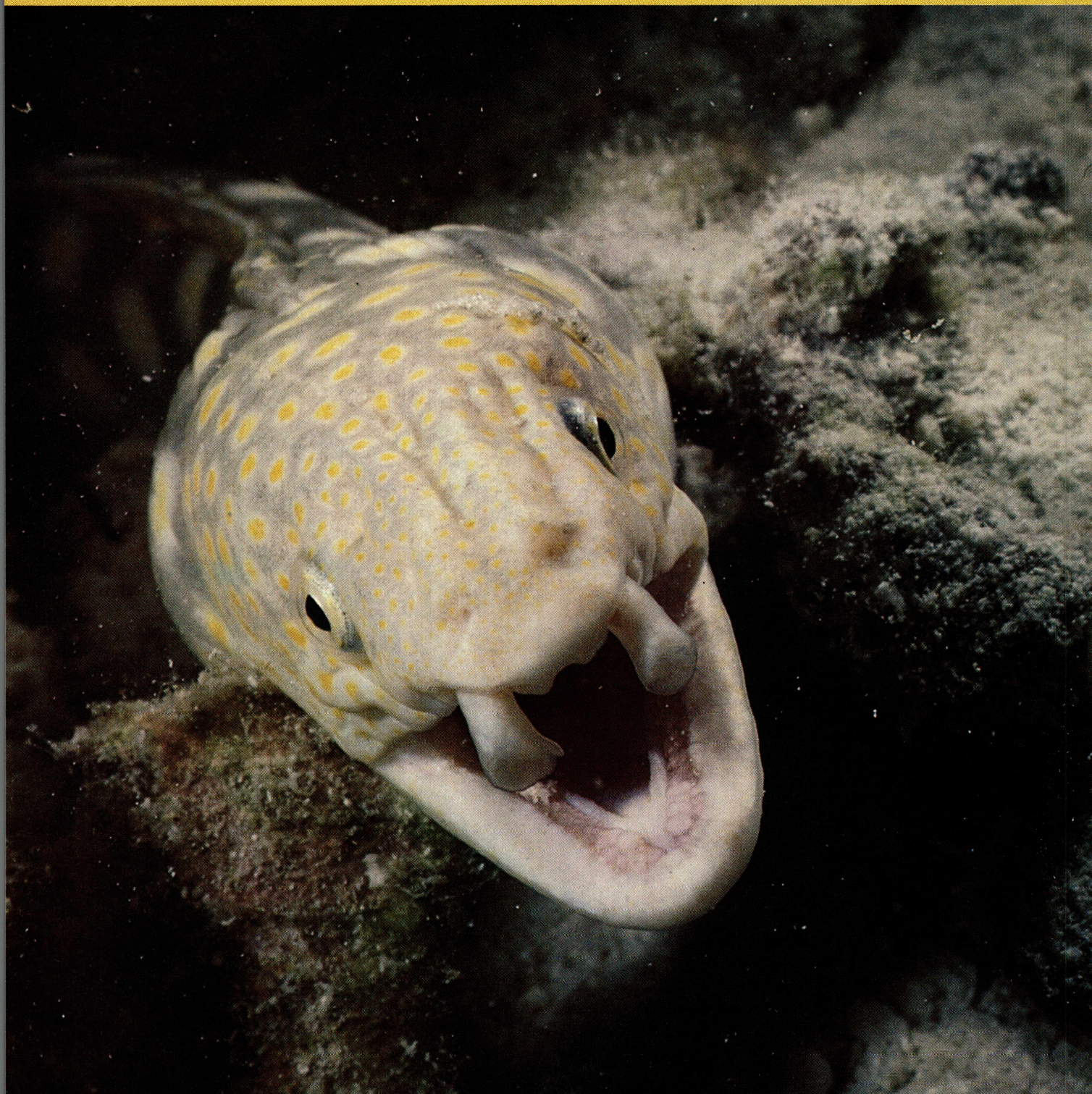
Although much of this reef is heavily sanded, there are many lovely anemones, Christmas tree worms, arrow-crabs and banded coral shrimp. As with most reefs around Bonaire, Porch Reef has its share of small black and white spotted morays. On several occasions, seahorses have been spotted on this reef, including a bright yellow one. As for

fish, this reef offers a good opportunity to photograph scorpionfish, yellow snapper, Spanish hogfish, soapfish, etc.

KLEIN BONAIRE MACRO SPOTS

Jerry's Jam is best known for its large population of friendly moray eels. They have been hand fed and will pose for portraits with a 1:3 macro tube. The reef is loaded with small, iridescent azure sponges which will fit beautifully into a 1:3 framer. The shallow reef area is loaded with purple-tipped and green-tipped anemones. It is a great place for shrimp photos.

Twixt Reef is loaded with Christmas tree worms, which grow on just about every coral head. Unlike those at the Town Pier,



these tube worms are surrounded by corals and stand out from their background.

There are a number of bristleworms on this reef ranging in size from two to six inches. The smaller ones will fit a 1:2 framer while the larger ones require a 1:3 framer. They come in a variety of colors such as red, orange and green and make a striking photo when the pure white bristles flare out.

Ebo's Reef is a deeper and more rapidly sloping reef which is loaded with all types of invertebrates. One of its most unusual features is a large orange basket sponge. Along the upper edge of the sponge are more than one dozen black and white crinoids. If you look closely,

you will find small black and white shrimp clinging to the feathery arms. These tiny shrimp can be photographed with a 1:1 macro tube.

NIGHT DIVES FOR MACRO

One of the most popular dive activities on Bonaire is night diving. In fact, there are night dives conducted every night of the week. Most of these excursions take place from shore, because it is extremely convenient.

Night diving is an ideal time for macro photography. Many exotic creatures not seen during the daytime hours come out of hiding at night and provide the macro photographer with a whole new array of subjects.

Tube anemones rise out of the sandy bottom spreading their tentacles like delicate flowers. These beautiful creatures can best be photographed with a 1:3 macro tube. *Tubastrea* cup corals growing on the sides of pilings, piers, and shallow coral formations extend their bright yellow and orange tentacles at night. The Town Pier blossoms into a dazzling wall of brilliant colors.

The rare orange-tipped anemone (which only makes its appearance at night) is often seen at Calabas Reef. Basket starfish remain curled up in a tight ball during daylight hours, but crawl up on top of coral heads and spread their radar antenna-like arms to catch drifting plankton at night. Bright crimson starfish hide during the day, but are seen prowling the bottom at night. Many fish which are hard to approach during the day can be found quietly sleeping on the sea floor at night. It is fairly easy to approach them for close-ups with a 1:3 macro framer.

BONAIRE DIVE OPERATORS

Because of its rising popularity as a photographic resort destination, Bonaire dive operators are now catering to the underwater photographer. Just about all of the Bonaire dive operators are experienced in underwater photography and serve as excellent guides to the very best locations for macro pictures. All of Bonaire's dive operators are now offering camera rentals and resort classes in basic underwater photography.

Photo Bonaire is the most recent addition to the island's photographic services. Operated by Chris McLaughlin at the Flamingo Beach Hotel, this complete underwater photo center offers six hour processing, rentals and instruction.

For more information, contact any or all of these dive operators:

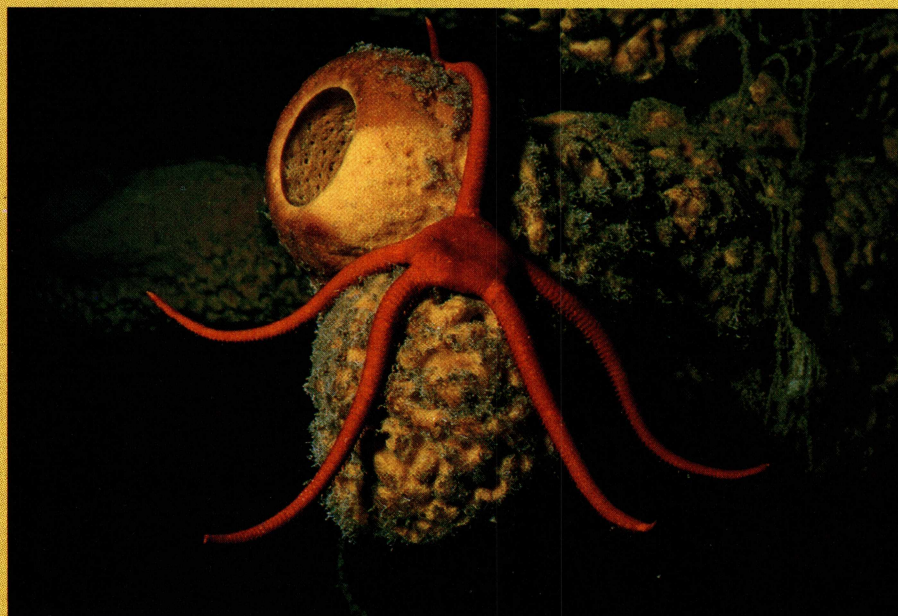
BONAIRE DIVE OPERATORS

Dive Bonaire/Flamingo Beach Hotel
Peter & Alice Hughes
P.O. Box 686
Ithaca, NY 14850
(800) 847-7198

Bonaire Scuba Center/Hotel Bonaire
Ady Averts — Eddie Statia
Bonaire Tours, Inc.
Box 775
Morgan, NJ 08879
(201) 566-8866

Cap'n Don's Habitat
Capt. Don Stewart
Aquaventure International
P.O. Box 237
Waitsfield, VT 05673
(802) 583-3158

Carib Inn
Bruce Bowker
P.O. Box 68
Kralendijk, N.A.
Telephone: 8819

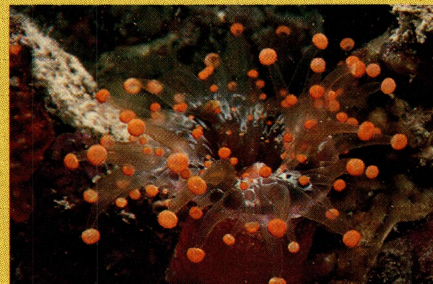


Opposite page, a sharptail snake eel at Calabas Reef, photographed with a 1:2 extension tube.

Above, a crimson brittle star at Town Pier — 1:3 extension tube.

Left, cup coral adorns the pilings of Town Pier.

Below, an unusual orange-tipped sea anemone photographed at night.

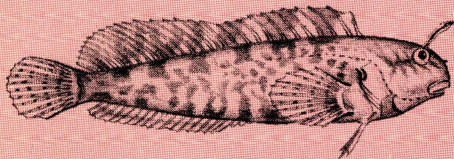


The Bay Blenny

(*Hypsoblennius gentilis*)

There are two major groups of blennies—the Blenniidae (combtooth) and the Clinidae (scaled blennies with fixed, conical teeth). Ichthyologists are unsettled as to the third group, which is either the Tripterygiidae (threefin blennies) or Chaenopsidae (flag blennies), although these latter groups have often been considered part of the Clinidae. □The bay blenny is a combtooth (Blenniidae), having a row of small, close-set teeth resembling a comb. It occurs in the Gulf of California, where it is commonly called *trambollito de bahia*, and it is also found in shallow waters along the Pacific Coast of California. According to ichthyologists, D. Thomson, L. Findley and A. Kerstitch, of the University of Arizona, the range of the fish on the Pacific Coast is from Monterey, California to Bahia Magdalena, and in the Gulf of California it is found from Bahia Santa Ines and Guaymas to the northernmost reefs. Interestingly, the bay blenny is not found at Cabo San Lucas (a point that connects the gulf with the Pacific) and therefore its distribution is called disjunct, or disconnected. □The bay blenny is common where found, and according to the three Arizona scientists it is the commonest combtooth blenny in the upper gulf. Generally it lives in rocky tidepools, such as those of Puerto Peñasco, or in shallow waters of bays and estuaries, although California Fish and Game biologists, Miller and Lea, have recorded it in depths of up to 80 feet along the Pacific Coast. □Blennies are bottom dwellers, rarely swimming except to make a dash for food or shelter. They are fearless little fishes and are often seen perched on a rock or coral head, propped up on their strong pectoral fins. The blennies are known to use these fins for walking, even for manipulating objects, and this, together with their

alertness, is a signal to scientists that these fishes are highly intelligent. They are also strongly territorial and tidepool blennies have been known to take a nip at human fingers. □*Hypsoblennius* is a genus of the Blenniidae and can be distinguished from other blenniids by a comparatively small mouth. *H. gentilis* is further distinguished by its coloration, and in this particular species there is a difference between male and female. Both have dark, greenish-brown, leopard-like spots that cover the head and forward part of the body, with



broad bands toward the rear, but males will generally be more darkly pigmented. The female has a smaller head and no large spots, a more pronounced barred pattern, and also a large blue spot on the dorsal fin between the first and third spines. The male has a

prominent flag-like cirri on top of the head and a red throat that becomes brighter during mating season. □The mating behavior of the blennies is similar to that of the gobies, in that the male selects a nest and then goes through a series of motions which have been described as push-ups, head jerks, and quivers. When the female enters the nest, she goes in tail first. After the eggs are deposited she leaves and the male is left to guard the nest. It is during this time that the male blenny exhibits his fiercest territorial behavior. After the eggs hatch, the young larval blennies drift in the open ocean currents until they reach a shallow, littoral environment where they drop to the bottom. The bay blenny grows to about three and one-half inches in the Gulf of California and more than five inches on the Pacific Coast. Young or old, it is hardy, able to tolerate the extreme differences in temperatures between summer and winter, no matter where it is found. »

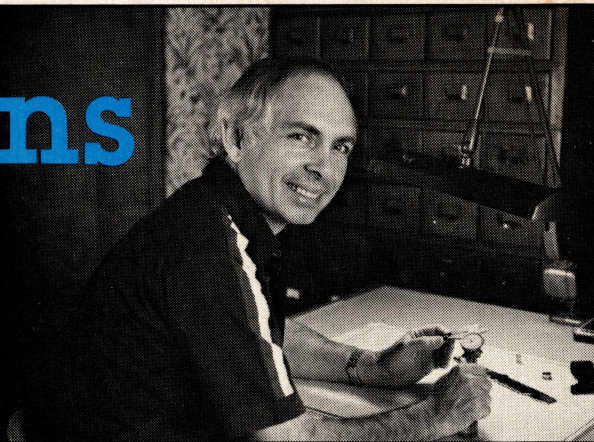
Photo By Alex Kerstitch-Text By Hillary Hauser

Kerstitch took the photo at Isla Tortuga, Baja California in 40 feet of water. He used a Canon F-1, 55 mm macro lens in a Farallon/Oceanic housing and a Subsea Mark 150 strobe. F22, 1/60 sec., at eight inches.



Blackie Collins

Wenoka's Secret Weapon



Wenoka Cutlery's new Z-Lock System is the result of more than ten years of development by Blackie Collins, the world's foremost (and most copied) knife designer.

During the early 70's, Michael Reese, an avid underwater photographer and one of SKIN DIVER's contributing editors, met Blackie at a gun show in Baton Rouge, Louisiana. He was interested in having some dive knives made to his specifications and Blackie had been recommended for the project. Several prototypes were made to Reese's complete satisfaction and over the next few years, more than 800 of these were produced by hand in Blackie's small shop in Atlanta, Georgia.

While making the knives for Reese, Blackie became acquainted with another diver who would greatly influence his interest in dive knives and sport diving in general. Soon after founding American Blade magazine, Blackie was pleased to notice that one of his first subscribers was James Jones, the author of *From Here to Eternity*. Jones was a knife enthusiast and along with his subscription he sent Blackie a note telling him how much he admired his work in knife design. Blackie wrote back to Jones telling him how much he enjoyed his writing, especially *Go to the Widow-maker*, a novel in which sport diving played an important part. Ensuing correspondence led to idea swapping about dive knives and Blackie began to develop more feeling for the true need of divers who trust their lives to the efficiency and quality of their equipment.

After years of making knives to the specifications of other divers, Blackie began to make them according to his own ideas. Using some of the proven features which Jones and Reese had suggested, and adding a few of his own, Blackie began to experiment with various methods of carrying the knives so that the diver would have immediate access. Unfortunately, he had no connections in the dive equipment industry and all of his knife-sheath designs ended up as stand-

ard sporting products for the hunting, camping and general outdoor market.

While attending a sporting goods show in Chicago, Blackie met Joe Zel, the president of Wenoka Cutlery. Zel had followed the progress of contemporary custom knife makers for many years and was particularly interested in Blackie's innovative designs. After meeting casually at a few shows, including the annual Knife Makers Guild Shows in Kansas City, where Blackie's new designs were always immediate sell-outs, Zel decided that his company and the dive industry could benefit from Blackie's creative talents. He approached Blackie with a proposal and the response was enthusiastic.

After agreeing to become Wenoka's vice president of product development, Blackie added a stipulation which most companies would not have accepted. He would design new lines only if Wenoka would agree to produce the finest product available with no restrictions on his choice of materials, production methods and general quality standards. He also insisted that the knives be sold at prices which would put them within the reach of all divers. Most designers are severely restricted by the many limitations which are imposed by the companies which produce their ideas, but in this instance, Blackie was given *carte blanche*. Zel agreed, with no qualifications, and the new Z-Lock System was on its way.

The first step in the design of the new knife was to create not just a knife but a system which would meet the needs of all divers. An added benefit of this concept would be the utilization of standardized components to help lower cost and simplify inventory stocking for dealers and service centers. The priorities would be emergency accessibility, convenience of carry, safety, strength, resistance to corrosion and styling. Also, the design had to be completely original in all respects. No one will deny that the Z-Lock System is new. From its looks to its feel, this is a new knife.


The heart of this new knife system is

the button which protrudes slightly from the side of the handle. It locks the knife in its sheath yet allows the diver to remove the knife instantly and return it in a simple, one-handed motion. No visual assistance is necessary and even the thickest gloves or mitts do not interfere.

Several models are currently available in the Z-Lock series. Four knives feature the standard handle which is made from a new, fiberglass filled thermal resin. The integral double guard and special contour offer a comfortable and extremely secure grip. The next two knives in the line-up are smaller with a single-guard handle. The last model is a symmetrically designed stiletto with a double edged blade. All knives feature the same handle material and the same locking and assembly mechanism which is fully interchangeable within the system. Blade styles are also interchangeable within each handle size.

The button mentioned earlier offers another benefit which is of particular interest to divers. These new knives can be disassembled completely without the use of any tool other than a coin or similar object which can serve as a screwdriver. After use, any knife in the Z-Lock System can be taken apart and thoroughly cleaned. It is also possible to interchange blades, making it conceivable for a diver to have several blades for different purposes. The options available for a systems approach such as this are endless and Wenoka has many new ideas in progress.

The sheaths are made from the same material as the knife handles and are textured to match the handle finish. Wenoka's special molded rubber straps and stainless hardware complete the package. A two inch slot in the sheath allows the knives to be worn on standard nylon webbing or other belts.

The six Wenoka Z-Lock system knives come with black or orange handles and start at \$39.50. Ask to see models 8521 through 8527. For more information contact Wenoka Cutlery, 1134 53rd Court North, West Palm Beach, FL 33407. 



nikon's rubberized binoculars

Nikon is best known for its superb line of SLR cameras and super sharp lenses. And, divers find the name synonymous with underwater photography and the world famous Nikonos. Yet few people realize that Nikon also manufactures a very fine line of precision binoculars. In fact, Nikon is one of the few camera companies which manufactures its own optical glass (a secret formula) as well as grinding and polishing every lens element that goes into its camera systems. This same high level technology and design goes into the manufacture of binoculars. Nikon does it all — from pouring the glass, to polishing the lenses, to assembling the entire system.

At present, Nikon produces over 17 different models ranging from compact opera glasses to fix-mounted, long range telescopes. Nikon binoculars are highly prized among serious bird watchers, yachtsmen and sport fans.

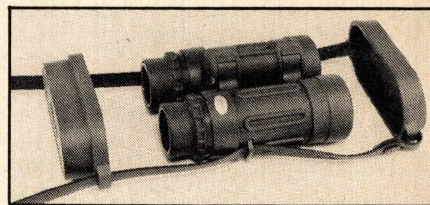
Of special interest to divers, are Nikon's unique rubber coated 8 x 30 binoculars. This unusual set of glasses

A lightweight, shock-resistant model for mariners

Text and photography by Geri Murphy

was specifically designed for hunters, boaters and other outdoor sportsmen. The major feature is a heavy rubber coating which helps to minimize shock and make the binoculars water-resistant. They can be used on a boat, in the rain and on the beach.

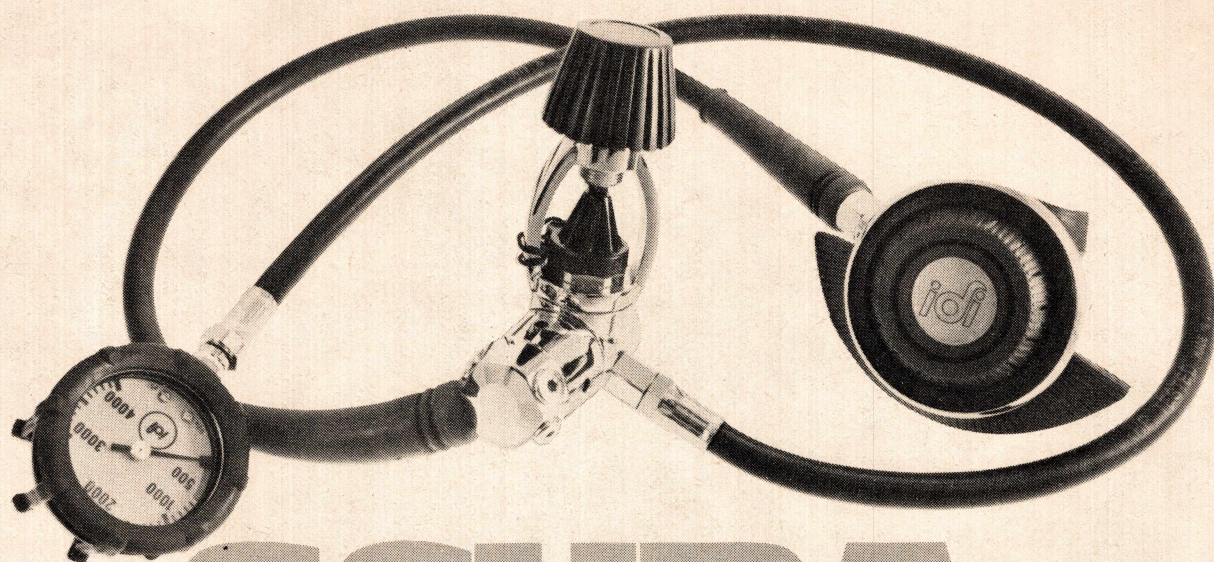
The Nikon 8 x 30D binoculars are extremely compact, measuring five inches in length. They will fit into most jacket pockets, dive gear bags and camera cases, or can be worn around the neck. The glasses utilize a roof prism lens and weigh only 24 ounces. They feature individual focusing for each eye as well as a central adjustment for eye width. The binoculars are totally coated in a thick sea-green rubber, except for the lens elements. Even the screws are sealed and painted. The binoculars come with a



Rubber coating on the 8 x 30D binoculars adds water resistance and shock protection. Lens covers are included.

front and rear lens cover.

Nikon's rubberized 8 x 30D binoculars can be a very handy tool for divers attempting to locate unmarked reefs or shipwrecks. They make an easy job of identifying and lining up shore bearings. The binoculars are also good for long distance viewing of dolphins, whales, turtles and other creatures often encountered on the surface at sea. The 8 x 30D binoculars have a listed retail price of \$472. For more information about Nikon Binoculars, contact: Peter Corey, Nikon Inc., 623 Stewart Ave., Garden City, NY 11530. 🐬



SCUBA STAR II

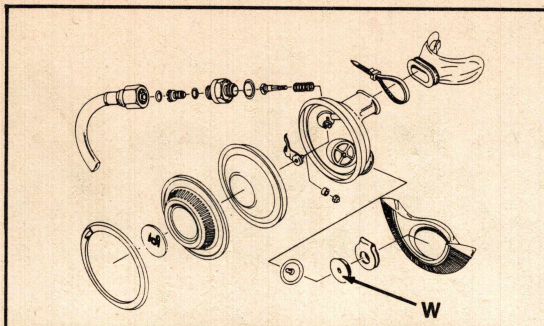
Not very long ago a new scuba regulator produced by International Divers Incorporated (IDI) hit the sport diving market. Perhaps hit is not the correct description. Snuck into the market, is more the case! The arrival of this regulator was not announced by a gigantic advertising campaign, with its attendant blitz of glossy photographs, and exaggerated sales pitches. It just kind of appeared. Early buyers were directed to the Scuba Star II primarily by word of mouth (e.g., recommendations from satisfied owners and sales personnel). In a display with other regulators the Scuba Star II might not attract much attention. Its appearance is clean and functional — certainly not flashy — and because of this, perhaps, not particularly eye-grabbing. Its design is basically conventional, and its materials are essentially traditional. And, unless a shopper is reasonably informed, the logo (simply, IDI) on the second stage cover might prompt him or her into looking for a product which displays a more widely advertised trade name. But that would be most unfortunate! In my opinion, this regulator deserves the attention of any serious shopper looking for a new regulator. And, I'm certain that such a prospective buyer would be impressed with

the Scuba Star II after comparing it to other high performance regulators. In case you haven't guessed, IDI is not one of the big names in dive equipment. It is, however, a sound company, with roots going back to the early days of diving. And, although you may not have heard much about them before, there's a very good chance that you have used scuba components made by IDI, or its relative, Kaiser Continental.

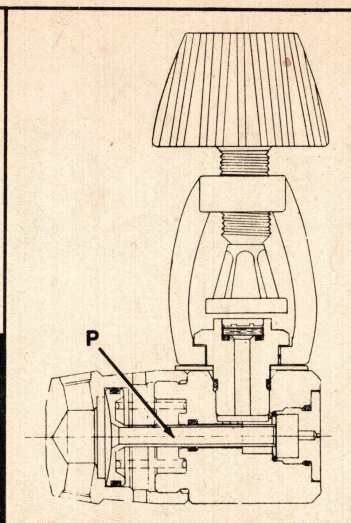
In appearance the Scuba Star II might look a little familiar to some readers, and it should. Its second stage is a direct descendant of the second stage of the Scubamaster regulators, models 7687 and 7690, both of which appeared in SKIN DIVER's Regulator Roundup in June 1980. If your memory is really sharp, you might recall that the model 7687 was tested by the U.S. Navy Experimental Diving Unit and found to rank among the top seven regulators (of the 36 tested) in terms of performance. (The results of this NEDU test were summarized in the November 1980 issue of SDM.) The model 7690 was not tested. For some reason the Scubamaster regulators were not out for very long. At any rate, IDI bought the rights to the Scubamaster regulators, made some improvements and — *Voila!* — we have the Scuba Star II!

So much for the background information. Let's look at the regulator itself. The first stage is a balanced, flow-through piston design. In fact, internally, this first stage is essentially the same as the first stage of the Scubamaster model 7690. Its original design and its more recent modifications by IDI have been made with an eye to simplicity, reliability, and increased breathing efficiency. The only moving parts are the stainless steel piston and spring. The piston itself is oversized, having a surface area about 28 percent greater than that of a more standard piston. The flow-through passage in the piston's stem is about twice as large as that found in standard pistons. Such oversizing is intended to improve the first stage's sensitivity to changes in water pressure (corresponding to changes in depth), and to greatly increase the volume of air it can supply at any time. The high pressure valve seat is polypropylene, instead of Teflon, which is more commonly used. Polypropylene is softer and more durable, and doesn't take a set like Teflon — all of which should result in less high pressure leakage, and more constant regulator performance.

The first stage housing is constructed of heavy duty, chrome plated, marine



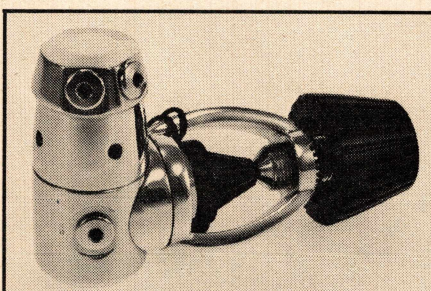
The second stage of the Scuba Star II regulator (above) has a small weight (W) suspended just behind the exhaust valve. The weight rests on the exhaust valve (when the regulator is in certain positions) in order to reduce freeflow.



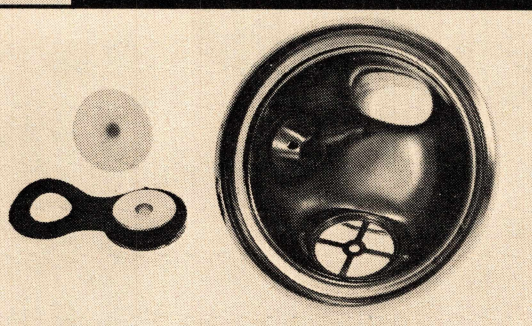
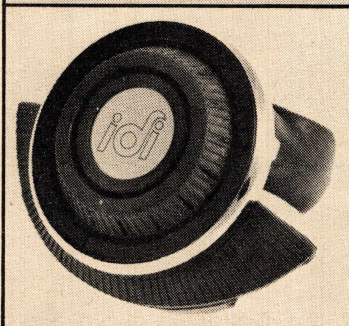
diaphragm senses changes in pressure (e.g., when the diver inhales), it moves inward, pressing against the demand lever. Such a movement causes the lever to open the downstream valve, admitting air into the second stage. Part of this air is channeled directly into the mouthpiece via a special aspiration tube, the design of which provides two main benefits: first, turbulence is reduced, and air delivery time, or response time, is quickened; second, a venturi effect is created which reduces the amount of suction effort necessary to maintain air flow during high inhalation demands. The exhaust valve, like the diaphragm, is molded from a very pliable silicone rubber compound. To reduce freeflow and prevent water from entering the second stage when it is used in certain positions, a small weight is suspended just behind the exhaust valve on what looks like a tiny rubber snorkel keeper. This weight hangs free, except when the diver is looking vertically down, or standing on his/her head — in which case the weight rests directly on the exhaust valve, keeping it closed against unwanted air or water leakage.

For my own performance comparison I connected the Scuba Star II to one of the outlets of a Y or slingshot valve (which was mounted on a standard scuba tank), and a well known, high performance regulator on the other outlet, then entered the water. While running through my routine checklist, comparing inhalation and exhalation efforts in the various positions, I became more and more impressed. In the normal (looking ahead, horizontally) position, inhalation effort was only barely detectable, and it didn't seem to change much when looking vertically down, or when rolling my head to the left or right, or even while standing on my head! Inhalation resistance did increase while I was lying on my back, looking vertically up — but this is a common trait of single hose regulators. From just sipping to exaggerated inhalations, the Scuba Star II delivered air with very little effort. In the exhalation department, this regulator performed just about as well. Only a slight exhalation effort was noted while in the horizontal position. This effort remained at about the same level when I stood on my head, seemed to increase a little when looking straight down, decreased somewhat when rolling my head to the right or left, and decreased even more when lying on my back (looking up). From very light to very heavy exhalations, relatively little resistance was noticed throughout the entire range. When looking horizontally or upward, exhaust bubbles would pass in front of the mask, but would cease doing so when looking downward at about 45 degrees or more.

(Continued on Page 81)



The first stage (left and above) has two high pressure ports and four low pressure ports. The stainless steel piston (P) is larger than normal to improve the unit's sensitivity to changes in water pressure. Below left, the second stage has a unique neoprene exhaust tee and cover. Below right, anti-freeflow exhaust mechanism.



TEXT AND PHOTOGRAPHY BY GEORGE COZENS

brass. It features a swivel yoke connection (rated at 4000 psi), a large (yoke screw) knob, a solid (O-ring sealed) dust cap, two high pressure ports and four low pressure ports (all of which have three-eighths inch standard threads). The low pressure ports are strategically located so as to reduce or eliminate the need for a swivel port block: Fewer moving parts, fewer potential problems. Intermediate pressure (also called lock-up pressure) is supplied to the second stage at about 135 to 145 psi above ambient pressure.

As already mentioned, the second stage is almost identical to that of the earlier Scubamaster regulators — all IDI did was to make the downstream valve more easily adjustable, so that tuning of the second stage can be conveniently accomplished with only simple tools and

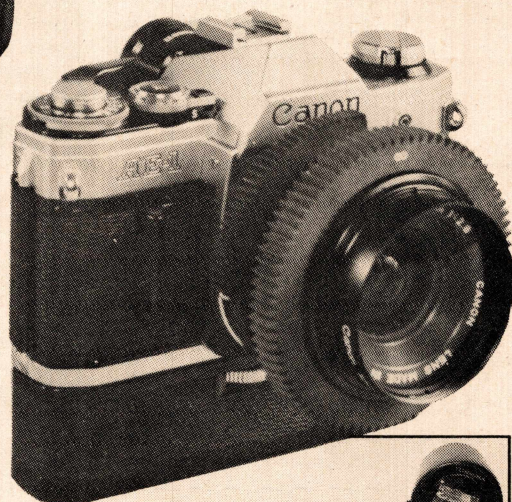
very brief instruction. The housing is chrome plated marine brass, and has a large, soft, neoprene rubber exhaust tee (it looks more like a mustache than a tee), and a neoprene cover that contains the readily accessible purge button. The exhaust tee and the cover are available in three colors: black, blue or orange. A plastic, quick-release, clip ring locks the rubber cover and the diaphragm in position, yet can be removed with a knife or flat screwdriver for easy access to the interior, should maintenance be necessary. The second stage diaphragm, and the mouthpiece, are made of pliable silicone rubber, for flexibility and resistance to ozone and chlorine. The stainless steel demand lever has a Teflon pad at one end, to reduce friction. This pad rides the back of a stainless disc which is bonded into the back of the diaphragm. As the

Marine Capsule A



Canon builds a distinctly different
U/W housing for the
professional photographer

Text and Photography by Geri Murphy



Canon company of Japan recently developed an underwater camera housing which is so radical in design it has already established three precedents. First, it is the only commercially available 35 mm SLR stainless steel camera housing. Second, it is the only housing of its kind that accepts several different motor drive cameras and some 30 different lenses. Third, it is by far the most expensive 35 mm housing, with an impressive price tag of over \$2,700.

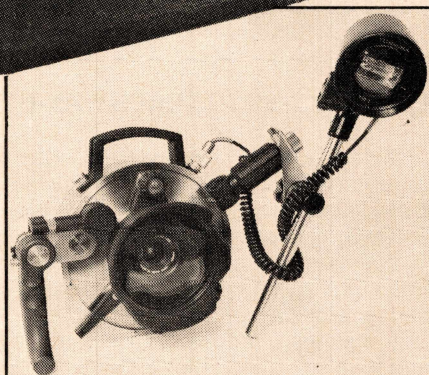
In addition, Canon's Marine Capsule A is perhaps the most rugged underwater housing currently available. It has many ingenious features never before seen on a 35 mm SLR housing.

DESIGN

The Marine Capsule A has a circular

design: There are no seams in the housing for maximum strength at depth. The body is a neat slice of stainless steel tubing almost eight and one-half inches in diameter. There is a suitcase-type handle on the top to facilitate carrying. On the right side of the housing is a contoured hand grip which can swivel and lock in two positions 90 degrees apart so the housing can be held either horizontally or vertically. A second removable hand grip can be attached to the left side of the housing for two-handed control or for mounting a flash arm.

The back plate (rear door) of the housing is a solid piece of highly polished $\frac{3}{4}$ inch thick molded Lexan with a built-in O-ring seal. This transparent panel allows the photographer to clearly see what is going on inside the housing and also de-



Canon's Marine Capsule A will accept several motor drive cameras including the AE-1. It is fitted for U/W strobe attachment (Nikonos II connector).

tect even the slightest leak. The rear door is secured in place by two stainless steel mounting screws which are permanently fixed to the door. When the tightening knobs are rotated in a counterclockwise direction, the mounting screws automatically lift the rear door from its seal.

A universal style mounting system inside the housing permits the Marine Capsule A to accept three different Canon cameras without any modifications. The housing will take the Canon AE-1 with electric power winder, the Canon A-1 or the Canon AT-1. All three models have electric film drive and various automatic exposure systems.

The front of the Marine Capsule can be fitted with one of three ports, thus allowing the usage of a wide range of Canon lenses. Over 30 different lenses, from the

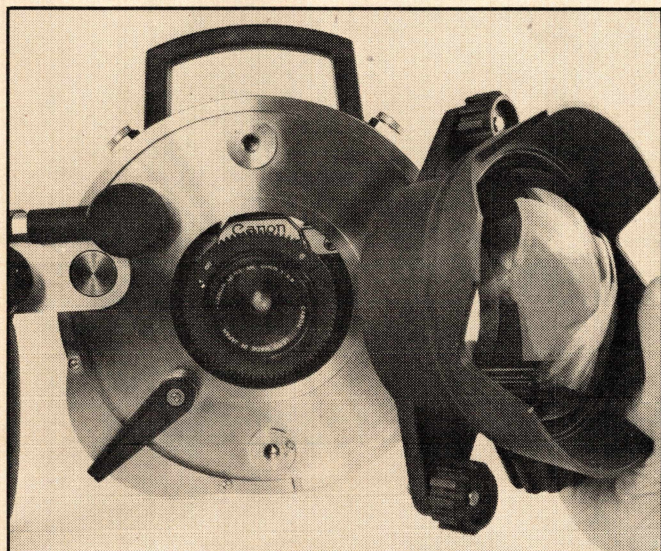
f4 macro to the 200 mm f4 telephoto. The FE port is an extremely short dome which fits close to the housing and is designed specifically for use with the 15 mm f2.8 fisheye lens. There is a wide selection of eight different focusing gear rings and three different aperture gear rings for fitting all 30 of the lenses that can be used with this housing. The lens versatility of the Marine Capsule A is virtually unequaled in the world of underwater housings.

A special negative magnifier eyepiece has been designed for use with the Marine Capsule A, thus enabling the photographer to view the entire picture field while wearing a facemask. This unique optical device slides over the normal eyepiece at the rear of the camera and is held in place by a shoe mount.

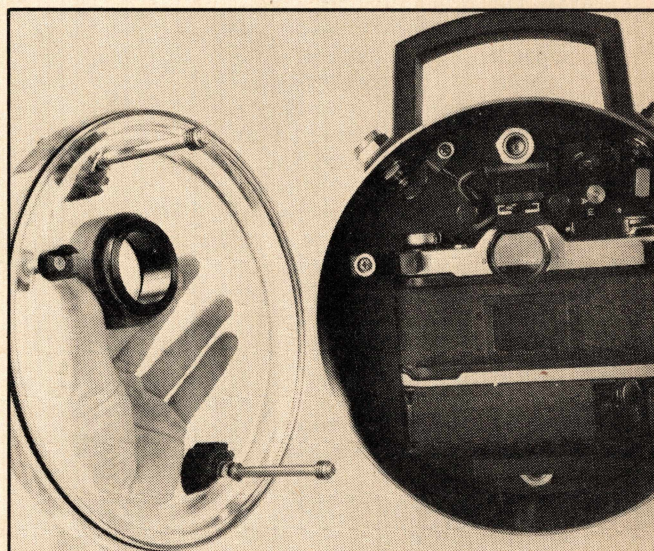
CONSTRUCTION

The main body of the Marine Capsule A is extremely unique as it does not contain any joints. It appears to be a spun stainless steel cylinder complete with a heavy duty front rib and seamless front flange. The wall of this portion of the housing appears to be 1/16 inch stainless steel, and the manufacturer guarantees trouble-free operation to a depth of 200 feet. The front lens port assembly is a high impact plastic and contains the focus knob and gearing, as well as an optical grade glass dome.

All external handles, control knobs, control levers and other accessories are corrosion resistant high impact plastic. All screws, bolts, nuts and washers are high grade corrosion resistant stainless steel. All control shafts which go through



The optical glass dome port will accept 24 different lenses. It is interchangeable with two other specialized ports.



The back plate (rear door) of the housing is a solid piece of 3/4 inch molded Lexan. It has a built-in O-ring seal.

15 mm fisheye to the 200 mm telephoto and several macro models will fit this housing.

The standard S port features an optical glass dome and can be used with the widest range of lenses. It is designed for 24 different lenses ranging from the 17 mm extreme wide-angle lens to the 100 mm lens. A special diopter correction lens adapter, the Close-up Lens 240, has been built by Canon for use with the S port. It helps to offset spherical aberration and neutralize the curvature of the dome front. It screws onto the threaded filter ring of the camera lens, fitting inside the front end of the housing.

The long barrel T-port features a flat front and is designed for use with four different lenses ranging from the 100 mm

The Marine Capsule A offers total control of the camera's many intricate functions including: full range of focus, full range of aperture selection from f1.4 to f22, switch-over to automatic exposure, shutter speed selection from one second to 1/1000 second, shutter release, and electronic flash. There is even a shutter release lock to prevent accidental firing.

The Marine Capsule A is designed for use with a variety of underwater strobe units, depending upon the photographer's preference. The operator can use any strobe with a Nikonos II connector — such as the Toshiba TM-1 — or, with conversion adapter a Nikonos III connector can be used; or a Nikonos II/EO adapter can be fitted to the housing for use with an EO connector.

the sides of the housing are also high grade stainless steel and are sealed by O-rings.

The internal camera mounting plate, baseplate, flash shoe mounts and hold down clamps are high impact plastic held together with stainless steel screws. The machine work on this housing is extremely high quality: Each housing is hand built.

With camera installed, the Marine Capsule weighs 9.5 pounds out of the water and 2.2 pounds underwater.

FEATURES

In addition to its unusual construction and wide camera/lens capability, the Marine Capsule A contains a number of radical features not found in other under-

water housings. Years ahead of its contemporaries, this housing provides a few interesting clues to future design trends.

While most underwater housings feature an index finger type trigger, the Marine Capsule A has a contoured thumb release. This one inch diameter, uniquely-shaped shutter release is at the top of the hand grip and operates perfectly in either the horizontal or vertical position. The long, large surface area provides extra mechanical leverage for a smooth and effortless shutter release. The photographer's hand does not tire and this design eliminates the possibility of jerky action or camera movement.

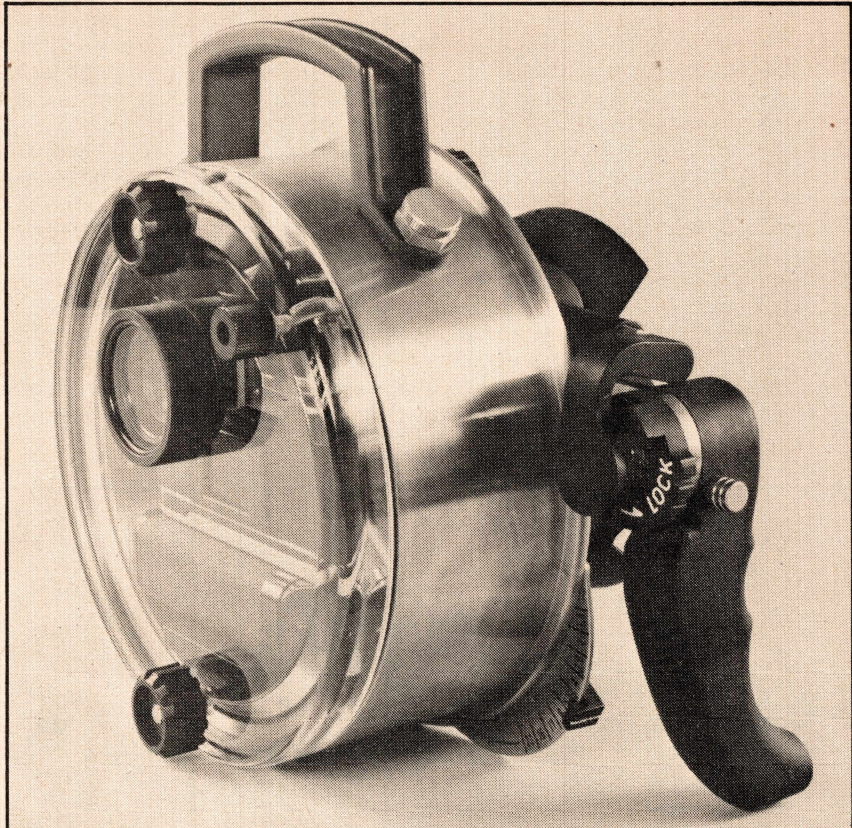
The Marine Capsule A also has an extremely unusual aperture control. In place of a rotating dial or knob, it has a three inch long swinging lever that moves across a five inch quadrant scale in a 90 degree arc, clearly picking out nine different f stops from f1.4 to f22. It is so large a scale that half f stop adjustments can be made with ease and accuracy. The scale is stainless steel with f stop and half f stop calibrations engraved into the metal plate. There is also an A position for automatic exposure.

While most underwater housings anchor the camera with one screw mount, the Marine Capsule A has three separate screw mounts positioned equally 120 degrees apart. A stainless steel tripod screw holds the motor drive firmly to the baseplate inside the housing. At the upper right and upper left of the camera are two rugged clamps which lock it into position. Once it is mounted inside the housing, the camera will not shift in place.

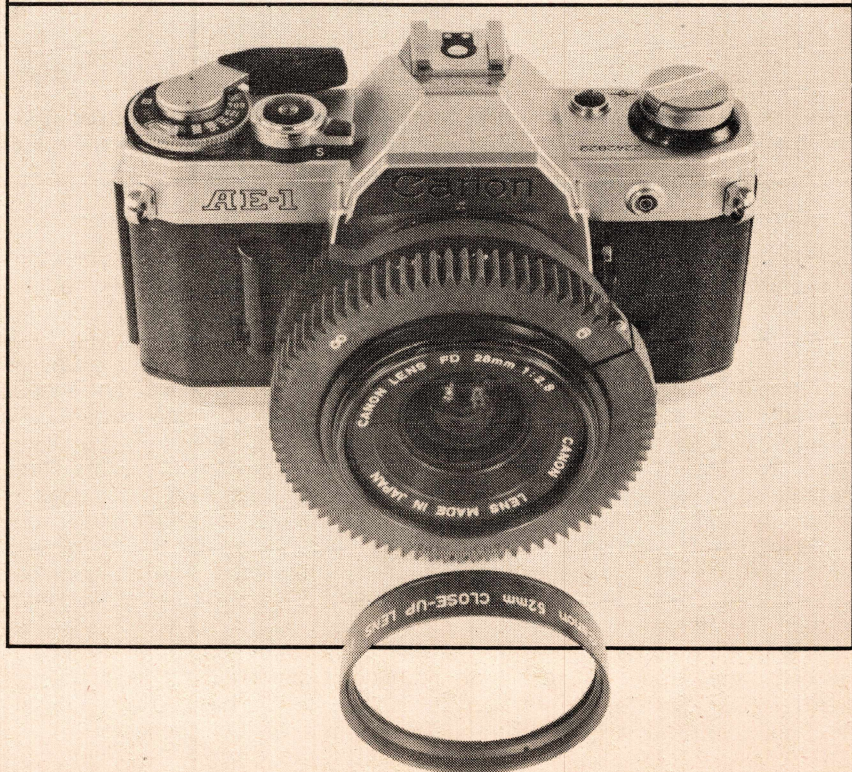
Still another clever device is the built-in mirror. Positioned at a 45 degree angle above the top of the camera, this one inch square mirror allows the underwater photographer to observe the camera's shutter speed knob and frame counter window by looking through the rear door of the housing. The mirror is a reflective metal mounted on a corrosion resistant plastic flange.

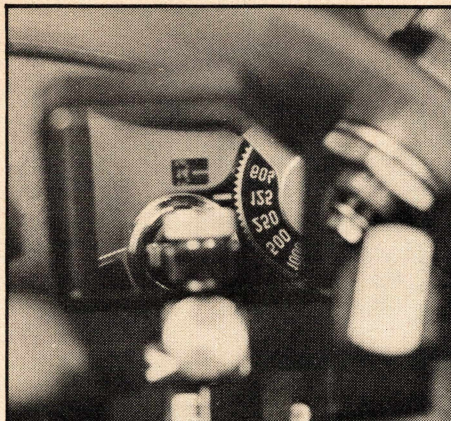
CONCLUSION

Canon's Marine Capsule A is a most impressive underwater camera housing, as is its price. Obviously, it was not developed for the amateur but for the professional or semi-professional photographer who wants super high quality. Canon's housing is both rugged and extremely versatile.



The Marine Capsule A is the only precision built stainless steel housing made for a 35 mm SLR camera. A special adapter (below) known as the Close-Up Lens 240, helps to optically match the lens and housing port.

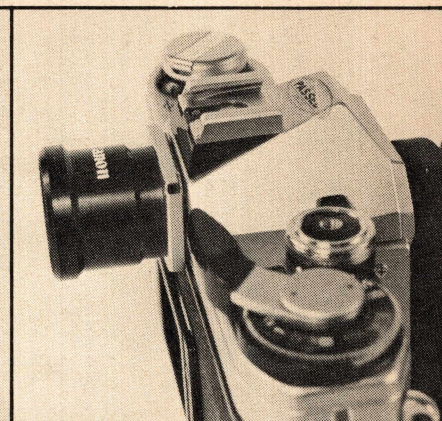




A built-in mirror, positioned above the camera, allows the photographer to view the shutter speed knob from the rear.




The Marine Capsule A features a locking, contoured thumb release for triggering the camera's shutter in a smooth motion.

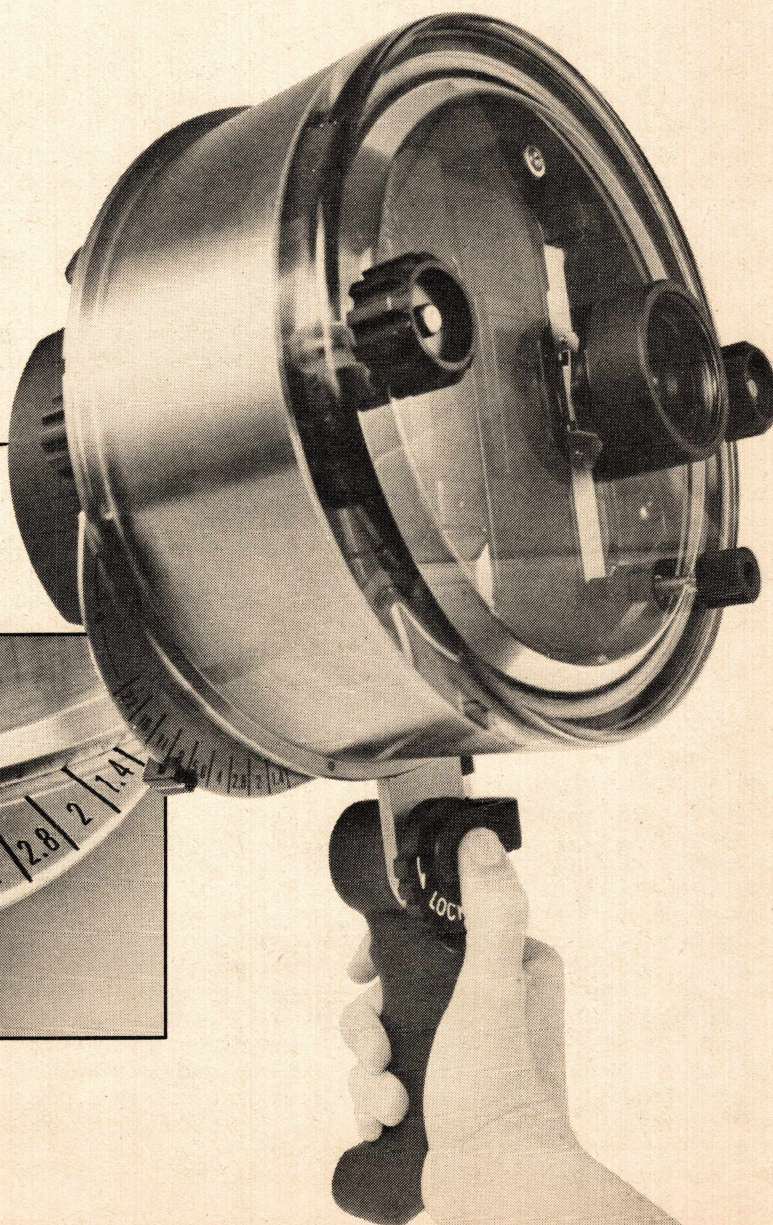
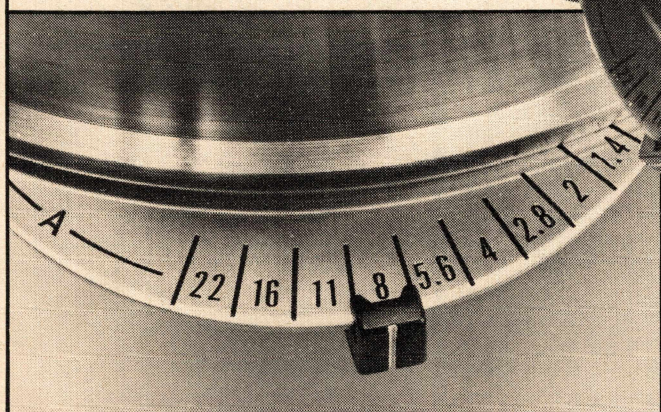


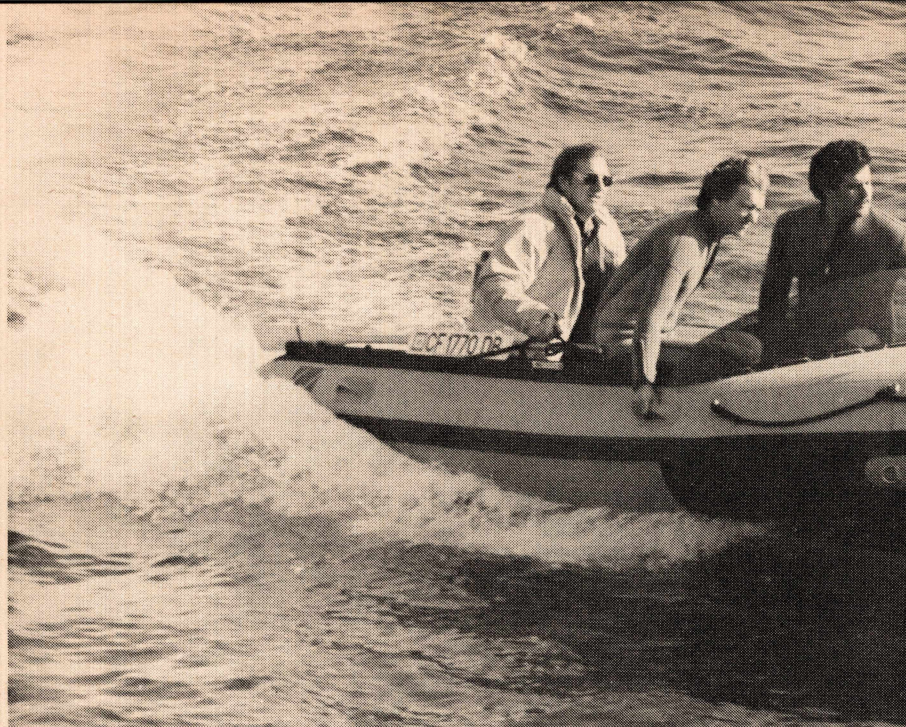
A negative magnifier eyepiece allows viewing the entire picture area through the housing, even while wearing a mask.

It is doubtful that very many Marine Capsules will be sold to sport divers. Yet those who purchase this fine machine should be very satisfied with its performance. In fact, this unique underwater housing is likely to become a collector's item.

For more information and brochures on the Marine Capsule A and Canon cameras write to: Canon U.S.A. Inc., One Canon Plaza, Lake Success, Long Island, New York 11042. 

The hand grip can be quickly rotated 90 degrees for vertical format photography. Aperture control is achieved through a unique swing lever and quadrant scale.





Zodiac Mark III Grand Raid

**Rugged dependability
for long
open water trips
for 4 to 6 divers**

**TEXT AND PHOTOGRAPHY
BY ERIC HANAUER**

MARK III

Overall length15'5"
Overall width6'3"
Inside length8'2"
Inside width3'
Tube diameter1'8"

Passengers10
Maximum payload2420 lbs.
Maximum horsepower70

No. of chambers5 + keel
No. of valves4 shared + keel
Weight264 lbs.

Zodiac owners are fanatically loyal. They stoutly maintain that their inflatable boats are the best anywhere, anytime, under any conditions. What is it about Zodiacs that inspires the kind of owner loyalty associated with Porsches, Rolexes and Hasselblads? When assigned by SKIN DIVER to evaluate the Mark III Grand Raid, I had an opportunity to find out.

Zodiac sportboats come in three configurations: the Touring series, the Grand Touring, and the Grand Raid. The Mark designation refers to the length of the boat. The Touring is the basic model, with wood floorboards and plastic valves. The Grand Touring is the flashy sport model. It comes dressed in red hypalon with aluminum floorboards and metal valves. The Grand Raid is the beefed-up, military version. This boat is built to take the worst punishment an owner can dish out, in terms of carrying capacity, the speed of a high power engine and operation in any aquatic environment. Zodiac owners feel these features make the Mark III Grand Raid the ultimate inflatable dive boat.

The begin with, let's look at the specifications. The Mark III is 15 feet, 5 inches long, with an advertised payload of ten passengers, or 2420 pounds. This translates to a maximum of six divers with full ocean gear. It will accommodate an outboard motor up to 70 horsepower. The specs of the Touring series Mark III reveal the same numbers, at a list price more than \$2,000 less. What specifically does the Grand Raid owner get for his extra money?

The floorboards and stringers are anodized aluminum instead of wood. When tanks and weightbelts are rolling

around, that can make a difference. The transom is reinforced with extra attachment layers, allowing the use of more engine power in heavy seas. As an option, the Grand Raid will accept two 35 hp outboard motors.

Protection is provided by extra layers of nylon/neoprene/hypalon fabric along the bottom of the tubes and floor. An additional layer of heavy, solid neoprene extends under the external impact area of the bow. A stainless steel skid pad protects the underside of the transom when the boat is beached. Finally, the underside of the keel area has heavy, solid neoprene ridges for warding off sharp impacts at high speed. These ridges double as chines for better control. All this reinforcement adds some 44 pounds to the weight of the Grand Raid over its corresponding Touring model.

The inflation valves of the Grand Raid are nickel plated marine bronze, and are virtually indestructible. Zodiac repairman, Phil Cotton, has replaced only two of these valves in the five years he has been in business. As in all Zodiac sport boats, the chambers of the Mark III can be filled through any one of the four interconnecting valves, and pressure can be equalized among the five chambers. Cotton recommends lubricating the valves with grease about every six months, a simple task which can be performed by the owner.

One owner who came up with the extra \$2,000 for a Raid is Paul Franks, and he has no regrets. Paul bought his boat three years ago, and takes it diving four to five times per month. He states flatly, "I've never found conditions the boat can't handle."

Like any small, flat bottomed boat the

Mark III rides rough and wet. However, Paul tells of one trip he made in eight foot swells. "We were running alongside a 78 foot charter boat and even they were having a hard time. We were soaked, but at no time felt out of control . . . We knew that we were already in a lifeboat, and as long as we could hang on we were OK."

Franks usually keeps the boat on a lightweight trailer, which can be towed behind his Volkswagen bus. When folded, the boat and its 50 hp Mercury engine can easily be carried inside the bus. It takes two persons about 30 minutes to inflate the boat and set it up, with some help from a scuba tank or an electric pump. Paul claims he once did it in 17 minutes, just to see how fast it could be done. Set-up takes considerably longer when the manual foot pump is used.

for a demonstration ride. Scott McIntosh of Port-a-Marine, Costa Mesa, California volunteered his personal Grand Raid. He removed the remote steering unit for our photo session, so the boat could be portrayed in a diving configuration. Scott added, however, that a rear mounted remote unit is also available. It doesn't take up as much interior room as the front mounted one and allows the driver to sit in the smoother riding stern section.

There was plenty of room for the four occupants during the trip through Newport Harbor in addition to camera and dive gear. Once outside the harbor, Scott put the boat through its paces. The 50 horse Merc brought it right up to a plane. A ride in an inflatable always seems faster than it really is, perhaps because you are so close to the water. This one

Zodiac is 280 millibars, or about three psi. Many owners are afraid to inflate it that high, because that would put the needle of the Zodiac pressure gauge a quarter of the way into the red zone. He assured me that there is virtually no danger of overinflation because each boat is tested to 16 psi before it leaves the factory. As additional protection against chafing, indoor-outdoor carpeting can be placed on the boat floor. This works best if it is large enough to cover the inside of the tubes as well as the floor.


The only care recommended for a Zodiac is to wash it with fresh water after use and cover it if it is to be left out in the sun. Covering is important only to prevent fading, because the outer material, a neoprene/hypalon mixture, is resistant to damage from ultraviolet radiation and ozone.

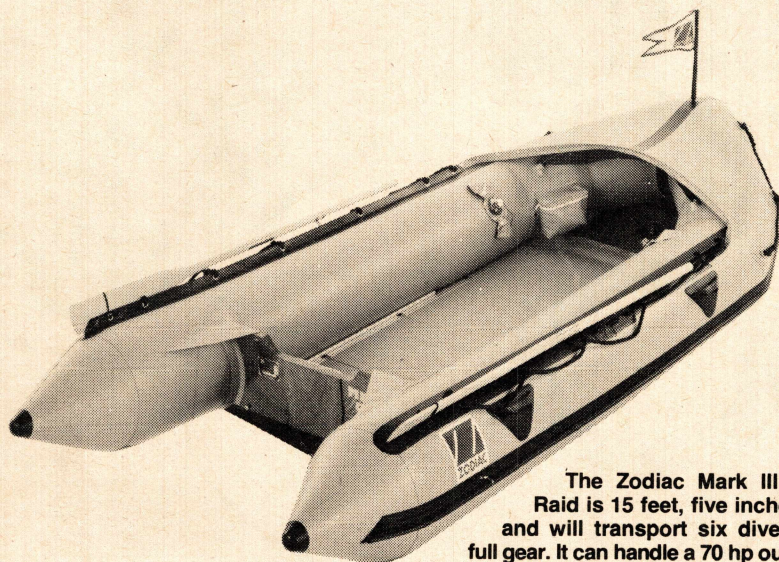
It makes little difference whether the boat is stored inflated or deflated. When packed in its bags for a long time, creases may appear in the rubber, but they have no effect on structural integrity. The only problem during storage is mice. Cotton has seen three boats in his shop which have been chewed. Since hypalon is not a staple in a rodent's normal diet, he guessed that the boats hadn't been properly washed and the little critters were attracted to the salt.

Phil showed me the worst accident victim in his shop, a Grand Raid which had hit a nail-studded board at 30 miles per hour. The result was a seven foot gash along one pontoon, deflating two chambers. Yet the owner was able to fold the pontoon over and motor back to port safely. A look inside showed the quality construction which makes such accidents repairable. Phil explained that the boats are handmade, inside out, then reversed for final assembly.

The Mark III Grand Raid is nearly ready for diving as it comes from the factory and few accessories are needed. But, there are some which will make the boat easier to use. One is a set of launching wheels, enabling the craft to be launched by two persons with the outboard motor in place. Another is the collapsible rubber gas bags in 9, 13, and 18 gallon capacities. They are light and corrosion-proof, but expensive. A rigid plastic gas tank might be a better buy.

Zodiacs in general are a better buy this year than last owing to the strength of the dollar against the French franc. The prices of most models have dropped. Unfortunately, the Mark III Grand Raid has held steady at \$5,500. Most shops, however, are willing to wheel and deal.

The bottom line is that the Mark III Grand Raid sets a high standard against which other boats must be compared. If the diver needs a rugged, dependable, safe boat to carry four to six divers in open water on long trips, he/she ought to give this boat a serious look. 



The Zodiac Mark III Grand Raid is 15 feet, five inches long and will transport six divers with full gear. It can handle a 70 hp outboard.

The Mark III Grand Raid classifies as a fixed inflatable, because it is more practical to keep it set up than to deflate it after each use. The boat is too large to carry on the roof of a van, so it must be trailered. On the positive side, it will carry four divers in comfort, rides drier than a smaller inflatable, and can make longer trips with its larger engine capacity.

Utilizing the special harness which is standard on Grand Raid models, the Mark III tows extremely well behind a sailboat or a powerboat. Dive gear can be loaded in it, leaving more room for passengers on the mother ship.

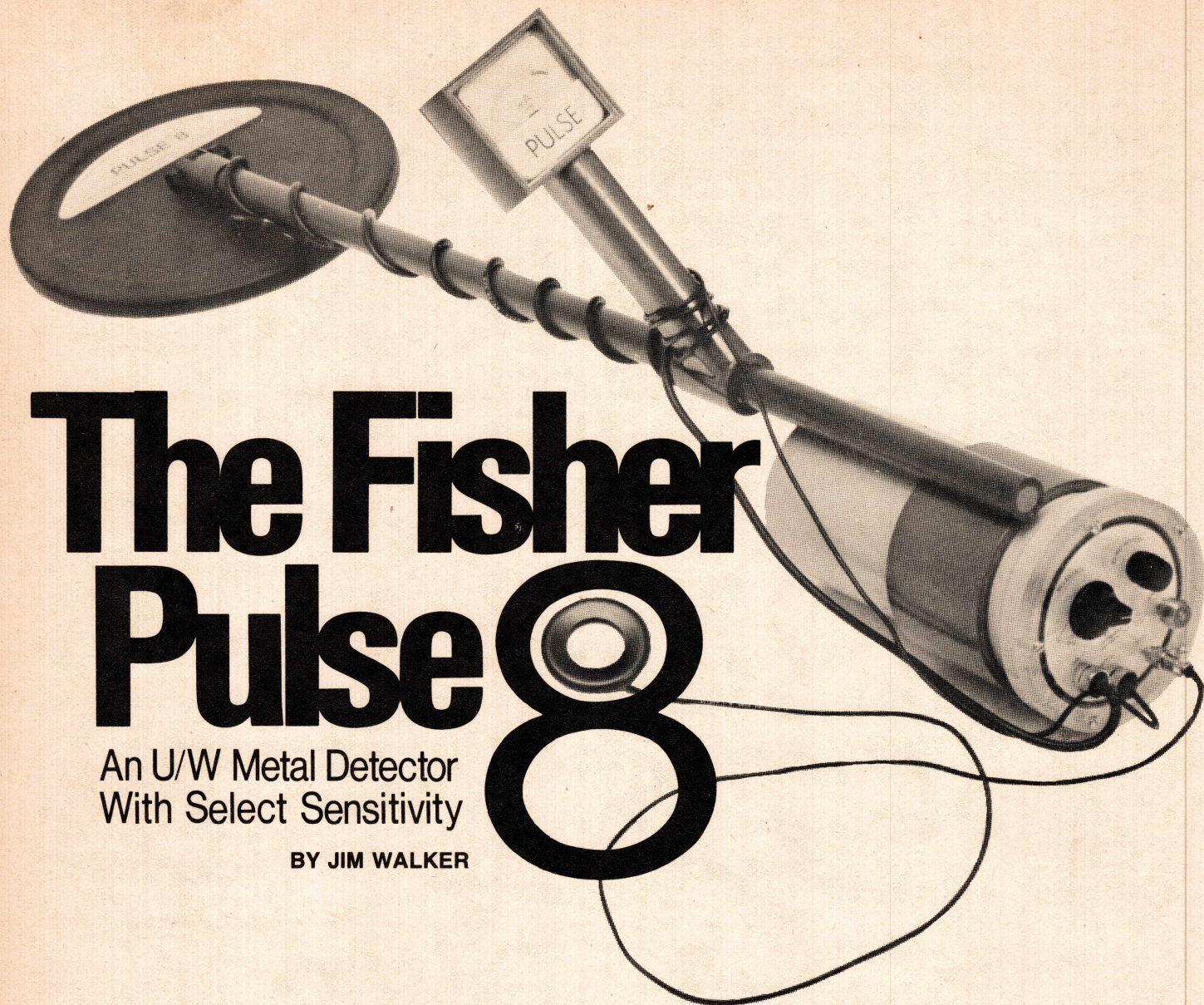
Paul's only criticism of his boat concerned the false stringers, the spacers on the sides of the aluminum floorboards. They are constructed of Bakelite plastic, and are very brittle. "They aren't in keeping with the quality of the boat," he says. Franks has made replacements of hardwood, a throwback to earlier days. The old floorboards had false stringers made of ash, and he thinks Zodiac changed to plastic for reasons of economy.

Having heard an owner's point of view, my next step was to visit a dealer and go

was no exception. Wide open, the Mark III will go up to 40 miles per hour, but we cruised at around 30. Scott hit a few sharp turns and I was impressed by the boat's sure handling and stability. The windshield and spray deflector kept both the interior and occupants dry. The Mark III exhibited the tendency to slip a bit on high speed turns — a characteristic of all inflatables — but at all times it felt under control. There was plenty of room for our divers to suit up. The boat provided a stable platform for the entire operation. Entries and exits were a snap.

The demo concluded, Scott suggested I visit Phil Cotton's Zodiac repair shop, to gain insight from a person who sees the worst of the owners' mistakes. Phil started out as a technician in Port-a-Marine's repair department, then bought out that part of the operation a couple of years ago. Like Scott and Paul, he really knows and appreciates Zodiacs.

According to Phil, chafing is the greatest enemy of an inflatable boat and divers are among the worst offenders. One way to avoid chafing is through proper inflation, which in the case of the



The Fisher Pulse 8

An U/W Metal Detector
With Select Sensitivity

BY JIM WALKER

Since the early '60's, the J. W. Fisher Company has concentrated on the manufacture of underwater metal detection equipment. Its line now includes a marine magnetometer and a variety of towable and diver-held metal detectors. The latest addition to the line is the Pulse 8 metal detector. It can be operated on land or underwater but the advantages of its design are most evident in the diver's world.

As owner Jack Fisher emphasizes, the major advantage of the Pulse 8 is its select sensitivity. It is extremely sensitive to metal objects, picking them out at up to eight feet away. And, unlike conventional detectors, the Pulse 8 is not sensitive to minerals in the sediment. This can eliminate a lot of unnecessary confusion and control adjustment — creating a more productive search.

An additional advantage of the Pulse 8 is its functional design. The system is composed of five sturdy components which work together as a unit: the

searchcoil or loop, shaft, needle meter, control/battery case and U/W ear-phone. In the preferred configuration (the Pulse 8 can be set up three ways) the entire system forms a streamlined unit 32 inches long. Thus, the detector is easy to handle underwater. The system weighs about 7.5 pounds in air and is slightly negative underwater. In a second, optional configuration, the shaft can be shortened to 23 inches and the control case worn on a belt around the diver's waist. The third configuration is for topside use. An 18 inch shaft extension allows the treasure hunter to operate the unit without bending over. A set of headphones with adjustable volume is supplied for on-shore use.

The searchcoil of the Pulse 8 is ten inches in diameter. This is an optimal size for diver use: Big enough to sense metal at a distance without sacrificing the ability to pinpoint small buried objects such as coins. The coil wire is embedded in solid, black epoxy so it

can't leak. The coil is attached to the shaft by a nylon bolt, which can be tightened to hold the coil at a desired angle, or loosened slightly to allow the coil to move freely with changing bottom terrain.

The shaft of the Pulse 8 is a sturdy seven-eighths inch diameter PVC tube. The ends are threaded and thus screw together to form the desired length. In the standard configuration, one shaft extends from the coil to the meter and joins there with the shorter top section. This latter section has a large PVC collar into which the control case fits.

The meter of the Pulse 8 is easy to read (two and one-half inches square) and marked in 0.02 increments from 0.0 to 1.0. A higher meter reading indicates a stronger signal from a find. The upper portion of the scale (0.8 to 1.0) is green and doubles as the charged zone for checking battery power. The meter is conveniently located on a five and one-half inch long strut which extends up from the shaft. This strut serves as the

hand grip. Its mid-shaft location reduces arm fatigue, especially for land use, by placing the grip near the unit's center of gravity (coil in front — control case behind).

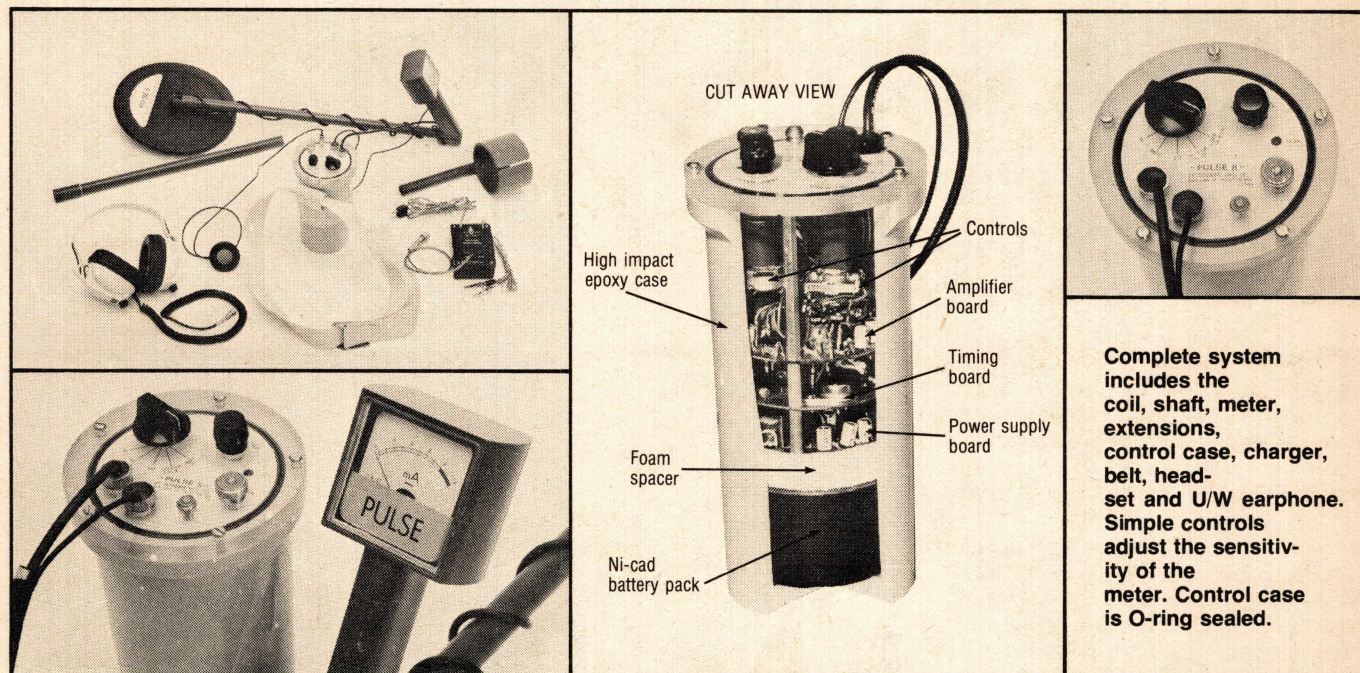
The control case of the Pulse 8 is a yellow epoxy canister with one-quarter inch thick walls. The clear, three-eighths inch Plexiglas lid is secured to the body by five stainless steel screws and sealed by a visible O-ring. The control case is implosion proof to 600 feet and warranted leakproof to 200 feet.

Divers will appreciate the simplicity of

audio signal just start to fire and then is backed off slightly. (The beginning of a continuous tone in the earphone and needle movement just above 0.0 are indications of firing.) When the detector is adjusted this way, the needle reading and audio volume will increase noticeably as the coil nears a metal object. The tone of the audio signal becomes higher pitched as the volume increases. Whenever the sensitivity of the Pulse 8 is changed (Selection dial) the fire point should be readjusted as well.

Two threaded terminals are found on

a huge metal hulk, and strewn thickly about it were a variety of metal objects. So many, in fact, that I had to limit my search to the low sensitivity scale to distinguish among them. With a "plant" which I brought with me I was able to pinpoint an object of coin size buried over a foot in the sediment. Using other known metal objects, I noted the detector was sensitive to object density as well as size. Denser metals and larger pieces gave correspondingly stronger readings. Larger objects were sensed further than smaller ones.



the Pulse 8's controls: Two dials do it all. The larger dial (Selection) has five positions: Off/Battery Charge, Battery Check/LED Check, Low, Medium and High. In the Battery Check/LED Check position the meter indicates the charge strength of the battery and a small red light on the control panel illuminates indicating the leak detection system is functional.

The low, medium and high positions adjust sensitivity. The high position is used to make an initial find. On this setting, the Pulse 8 will sense metal from the greatest distance. The low setting is used to pinpoint small finds or define the edges of larger buried objects. On low, the Pulse 8 will detect metal at only one-third the distance of the high scale. The medium setting will detect metal at one-half the range of the high setting.

The smaller control dial (Zero Adjust) turns approximately 315 degrees to adjust the "fire point" of the earphone and meter. With no metal near the coil, the knob is turned up until the meter and

the control panel. The larger is used for attachment of the battery charger. It operates on 110 volt AC or 12 volt DC current and will charge the batteries fully in 12-14 hours. (A full charge will power the Pulse 8 for five hours.) The smaller terminal is the connection for the underwater earphone or on-shore headphones.

Inside the control case are six ni-cad C cells and the advanced electronics which make the Pulse 8 pulse. These electronics are not intended to be user serviceable. If a problem occurs, the owner should call or write the Fisher factory.

On dives with the Pulse 8 I was impressed by its easy handling. Once in the water I simply placed the earphone under my hood and headed for the bottom. With excess wire wrapped around the shaft the Pulse 8 was a compact unit. It created no noticeable drag at slow swimming speed and it never felt heavy. I had become familiar with the controls earlier and was able to set them in less than 30 seconds. The wreck I was diving was

Care of the Pulse 8 is a snap. Simply rinse it in fresh water after the day's diving and allow it to dry before storage. Fisher recommends the batteries be charged before lengthy storage. The earphone should be disconnected and the terminal and jack rinsed thoroughly. The only places where salt water can lodge in the Pulse 8 are between the threaded PVC connections. Salt can't hurt PVC but open these and rinse with fresh water, otherwise a mineral crust will build up in the joints.

Handle the Pulse 8 carefully, it's tough but electronic gear shouldn't be banged around.

The Pulse 8 has a two year limited warranty and retails for \$1175. It comes with a charger, shaft extension, belt and two types of earphones, all of which can be neatly carried in a green nylon bag. An extra battery pack is available for \$35. For more information contact J. W. Fisher Manufacturing Company, Anthony St., Taunton, MA 02780; phone (617) 822-7330.

Subsea Mark 150

A classic u/w strobe with
Futuristic improvements

TEXT AND PHOTOGRAPHY BY GERI MURPHY



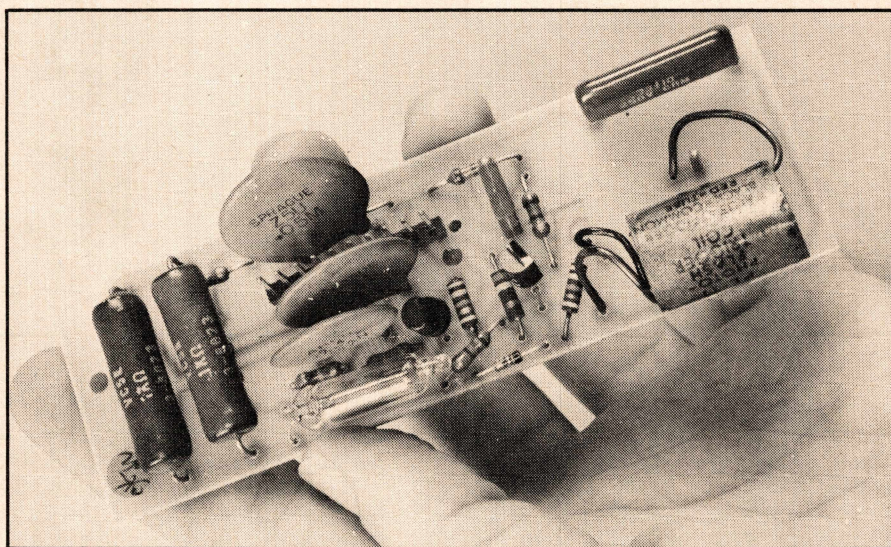
The Subsea Mark 150 is a classic among underwater strobes and just as popular today as it was when introduced. Designed in 1969, it was the first submersible strobe to hit the U.S. market. It was years ahead of the industry.

In the following years, the Mk 150 underwent several changes for updating, but the basic unit remained the same. Meanwhile, many other manufacturers introduced submersible strobes to compete with it, yet none ever matched the 150 feature-for-feature. Its distinctive design and years of proven performance have made the Mk 150 a classic. And now, Subsea Products has introduced a new version of the Mark 150 — a beautiful blend of classic features and radical innovations which put this unique strobe in a class by itself.

CLASSIC FEATURES

The Mk 150 is probably best known for its incredibly wide angle of flash coverage. It features a super wide reflector which puts out a circular cone of light 150 degrees wide. This strobe will cover the angle of just about any lens up to the fisheyes. The Mk 150 also features a unique adjustable flash tube which slides backward or forward within the reflector mount. Moving the tube backward changes the angle from 150 to 90 degrees.

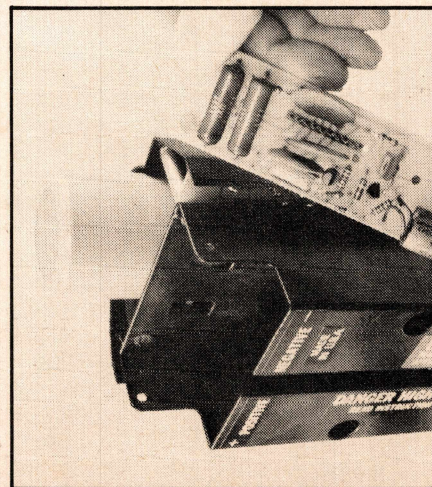
Subsea has always exalted the Mark 150 for its color output and even light. This strobe is fitted with a special beaded glass reflector, and delivers a light of 5500 degrees color temperature. Many underwater photographers claim this



Above, a spare electrical circuit board for the Mk 150 can be purchased for \$64.95.

Right, the circuit board can be easily replaced using only pliers and a screwdriver.

Far right, as a safety feature, a special discharge button drains electrical power from capacitor before the power cell is removed. The Mk 150 operates on a 510 volt dry cell. Three types of quick-disconnect flash cord are available — EO, Nikonos II and Nikonos III. The flash cord can be removed by unplugging the three prong connector and unscrewing the flash cord nut.



slightly warmer lighting produces rich colors and pleasing flesh tones.

Still another unique feature of the Mk 150 is its power source. It is the only underwater strobe that uses a 510 volt dry cell battery. This beefy battery delivers exceptionally high voltage as well as long lasting power. On the low setting, the battery can deliver up to 1500 flashes for macro and close-up photography. The 510 volt dry cell battery eliminates the need for lengthy recharging: A fresh battery can be inserted in less than one minute. The dry cell battery concept is particularly desirable for long range travel and use aboard dive cruise boats where charging is not practical. Three companies manufacture this type of battery: Eveready #497; Mallory #PF497; and Burgess #U320.

The three power modes of 50, 100 and 150 offer a choice of light output as well as an opportunity to conserve battery energy. For example, the operator can economize by setting the strobe on low (50) and thus obtain three times as many flashes as the highest power (150). Power selection also governs the recycle

time: 150 ws — six seconds; 100 ws — four seconds; and 50 ws — two seconds. There is a 1½ f stop spread in flash output between the high setting of 150 ws and the low setting of 50 ws.

The Mk 150 was one of the first underwater strobes to feature a built-in slave sensor. A small photo-electric cell mounted in the flash reflector makes it possible to trigger the strobe with the light from another flash. It is an extremely sensitive sensor, firing the strobe with as little as 18 watts of remote light.

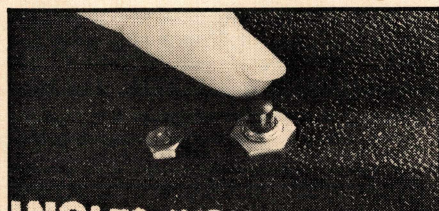
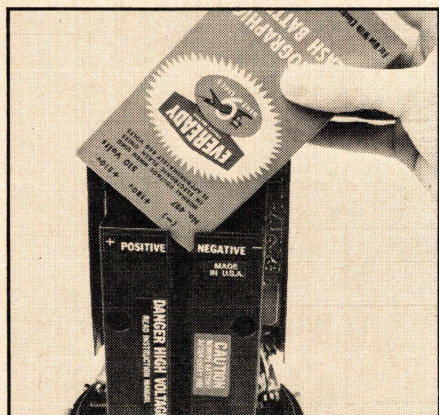
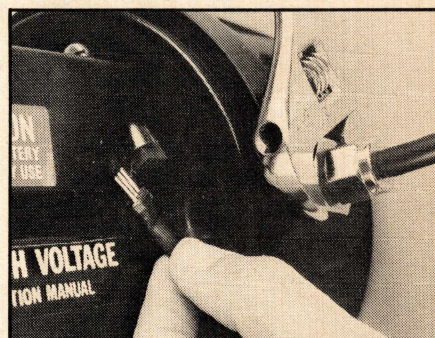
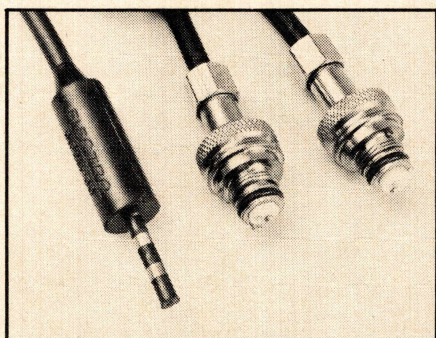
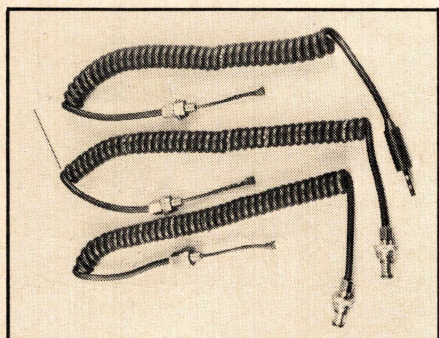
While the Mk 150 weighs seven pounds in air, it is neutrally buoyant underwater. One of the reasons it is heavy is the special high density epoxy casting from which it is made. This is extremely durable and resistant to deterioration. Mark 150 strobes manufactured 12 years ago are still in operation today. The strobe is designed and tested to operate to depths of 350 feet.

Another classic aspect of the Mk 150 is the flash connector. This was the first submersible strobe to be fitted with a coiled cord and the specially designed EO connector. This extraordinary con-

been greatly expanded with two new flash cord connections. Now, you can buy it with a flash cord that screws directly into any Nikonos. In addition, you can purchase spare quick disconnect cords so that the Mk 150 can be converted from EO to Nikonos connector.

One of the most futuristic concepts of the new Mk 150 is a plug-in circuit board which can be quickly disconnected and replaced within minutes. Should the strobe accidentally flood, the circuit board can be removed, washed and dried for reuse. And, should the circuit board suffer an electrical component burn-out, it can be promptly removed and replaced with a spare. A spare circuit board can be purchased for \$64.95 and can be installed with the aid of a simple screwdriver and pliers.

Another unique feature of the Mk 150 is a special discharge button for draining the capacitor. This button is depressed for 15 seconds prior to the removal of the battery or the replacement of either a flash cord or circuit board. It is a safety device designed to eliminate shorts or electrical shocks. The discharge button



nectors allows the photographer to quickly disconnect the strobe from one camera and connect it to another while underwater.

FUTURISTIC FEATURES

The 1982 model of the Mk 150 strobe appears very similar to the older models at first glance. However, closer scrutiny reveals a number of ingenious modifications which will delight most veteran underwater photographers.


First of all, the new Mk 150 features a quick disconnect flash cord which can be easily replaced either at home or on a trip. The only tool needed is an adjustable crescent wrench to unscrew the bulkhead connector. Inside the housing there is a quick disconnect plug for joining the flash cord to the rest of the strobe circuitry. A spare flash cord should be purchased (\$90 to \$94) and carried along on trips.

The versatility of the Mark 150 has

is inside the housing on the back of the battery chamber.

Subsea has also improved the visibility of the Mk 150 ready light by changing its position and combining it with an on/off switch. The new switch is made of clear plastic and the ready light is beneath it. Because it is larger, the photographer can see it from obtuse angles as well as from farther away.

The new improved version of the Mk 150 will fit all existing Subsea flash arms and brackets. There are a variety of flash arms, plus baseplates, to fit just about any Nikonos or underwater housing. Other accessories produced by Subsea Products include a carrying case, light meter bracket, macro extension tubes and an O-ring replacement kit. The Mk 150 sells for \$588.30 with a Nikonos connector or \$599.95 with an EO connector.

For more information contact your local Subsea dealer or write to: Subsea Products Inc., 1006 W. 15th Street, Riviera Beach, FL 33404. 



A CASIO DIGITAL FOR THE LADIES

TEXT AND PHOTOGRAPHY BY GERI MURPHY

At last — a lady's version of the underwater Casio watch! Casio, manufacturer of the world's most popular inexpensive underwater digital timepieces, recently introduced a lady's model to complete its family of seven watersports watches.

The lady's version of the underwater Casio measures slightly more than one inch square and approximately five-sixteenths of an inch thick. Despite its reduced exterior dimensions, this lady's version features the same size liquid crystal display (LCD) as its larger brothers.

The new lady's Casio is lightweight, yet extremely durable. It has a petite appearance but offers almost all of the same functions as the larger model. Its face is absolutely flat with contoured corners. Thus, the lady's Casio fits flat

against the wrist in a graceful, non-snagging position. It is available with either a stainless steel band or a less expensive resin wrist strap. Best of all, the watch is tested to a depth of 165 feet.

The face of the watch contains a small window with digital read-outs divided into two basic columns. There is the time in hours and minutes, or the date, in month and day. Flashing bars above the time display indicate the passing seconds. Each flash is equivalent to one second and each successive bar indicates a ten second interval. A plus sign in the upper left indicates pm.

On the right side of the watch are two buttons: The upper one activates a small built-in light which enables the wearer to read the watch in total darkness or dimly-lit conditions. The lower button switches the watch readout from time to date to alarm setting. When set on date mode, the numerical display gives the month on the left side of the window and the day on the right side. A single stationary bar indicates the day of the week.

The lady's Casio features a built-in alarm, complete with a time display for the preset alarm time. The alarm display reads in hours and minutes, and is activated by

pushing the lower button twice. A small AL appears in the lower right corner of the window indicating alarm display. The alarm produces a beeping tone which lasts a full 30 seconds. A small alarm symbol in the upper right portion of the window also appears.

In addition to the alarm, the lady's Casio can also be set to give a signal tone of two beeps every hour, on the hour.

The setting or adjustment of all watch functions such as time, date and alarm are accomplished by activating a small inset adjustment on the upper left side of the watch. A set of simplified instructions (including diagrams) are enclosed with every watch. The lady's Casio with the stainless steel band (LW-501) sells for approximately \$44, with a black or blue resin wrist band (LW-501C) it is approximately \$39.

SKIN DIVER tested the lady's Casio in open water and found it to be both corrosion resistant, and watertight within the full range of sport scuba diving depths. The watch is small, attractive, and extremely functional. It would make an ideal gift for any female scuba diver, snorkeler or watersports enthusiast. ➤



Imperial's Islander 200 Wetsuit

BY BONNIE J. CARDONE

An attention-grabbing ad introduced the Imperial Islander to SKIN DIVER readers. It featured a strawberry blonde wearing the partially zipped orange and yellow wetsuit. The full color ad was so successful that Imperial made it into a life-sized poster and printed its 1982 catalog on the back. This particular catalog has to be one of the most popular ever printed by a dive equipment company. It will probably still be hanging on walls years from now!

The Islander looked so good that we requested one to test. It proved to be every bit as attractive in our offices as it was in the ad. Made of one-eighth inch neoprene with Darnell two sides, the Islander is not one suit, but, with the various options available, actually a series of suits. It comes in men's and women's sizes from extra-small to extra-large. All of the suits feature a full length front zipper. The raglan sleeves, however, can be either long or short. There is a bathing suit cut; short legs; or full length farmer johns. The jacket that comes with the farmer johns is available with or without a beavertail. If none of these options suit you, you can order a custom Islander made to your exact specifications.


The Islander shown on this page is the WBS 253. It is orange and yellow, with long sleeves and bathing suit cut legs. The sleeves have wrist zippers for a snug fit. All of the suit's YKK zippers are Delrin, a non-corrosive, sturdy material. At the base of each zipper is a vinyl patch. This prevents water leakage as well as ensuring that the zipper pull will not come off the track.

All except one of the Islander's color combinations are Darnell two sides. We had never heard of a wetsuit made from this material before, so we asked Nik Salmela, Imperial's president, why the company had switched to that fabric. The answer is that Darnell provides the shiny good looks divers like. It also provides multi-directional stretch and is just as durable as nylon or Lycra. The one Islander in nylon two is the brown and tan combination. According to Salmela these particular colors look better in lower gloss nylon.

The Islander is well made. All seams are sewn as well as covered with an elastic seam tape for durability. The edges are also covered with seam tape. An unusual design feature is the collar, which adds style and flair. The contrasting panels make the suit flattering and extremely photogenic.

The Islander was designed for warm water diving, snorkeling, windsurfing or waterskiing. The one-eighth inch neoprene is flexible and provides warmth as well as protection from stinging organisms or sharp rocks and coral.

Prices for the Islander start at \$90 for a stock suit with short sleeves and bathing suit legs and go up to \$272 for a stock suit with farmer john pants and bolero jacket. Custom suits are slightly more.

The Islander is available at dive stores nationwide. For the name of the Imperial dealer nearest you write: Imperial Manufacturing Co., P.O. Box 4119, Bremerton, WA 98312. 

THE HENDERSON TROPICAL SUIT

For warm water wear By Jim Walker

The Henderson Tropical Suit is an eye catcher. The one pictured has an outer surface of shiny silver Lycra with red Lycra from the knees down. Red Lycra accent stripes complete the package. The suit also comes in a white Lycra/black accent combination, and a blue nylon one version of the farmer john is available. The nylon one style has nylon outside on the body and the reverse combination, skin outside, on the legs.

The bright color combinations of the Lycra models stand out beautifully in the blue water found in most tropical areas. This can help buddies keep track of each other, and it makes divers more photogenic. A silver or white suit will reflect strobe light better than darker colors. This will reduce the exposure problems created when a diver is photographed with shiny fish.

The suit's good looks don't stop at color. The body-hugging one-eighth inch neoprene has a stylish cut. The jacket has a crew neck and comes with or without a beavertail, and the edges of the neck, cuffs and hems are covered with an elastic, nylon tape. The tape on each edge is one continuous piece with the ends overlapped and bar tacked. The farmer john pants have a front zipper for easy entry.

Now, you might be saying to yourself, "Looks are nice, but why a full suit in warm water? And, what about comfort?" Body temperature is around 98.6° F. Tropical waters vary in temperature from 72° to about 85°. After being submerged for 45 minutes in water this temperature, an unprotected diver gets cold. That's why most divemasters at tropical resorts — who dive every day — end up wearing full wetsuits. The water feels warm at first but the more you dive, the colder you feel. Coming up on deck into an afternoon or evening breeze after a dive can be a chilling experience. Henderson's combination of a full suit and thin neoprene solves the temperature problem without sacrificing comfort. The flexibility of this suit and its nonconstricting design allow the freedom of movement divers associate with tropical diving. Because the suit is thinner, divers will need less weight. Another benefit of full body coverage is protection from cuts, scrapes and stings. Coral has sharp edges, there are stinging organisms in the water that are sometimes too small to see, and fire coral has a way of finding bare skin. If you're a photographer, you'll end up on your knees or bracing an elbow somewhere. At these times you'll be glad it's Henderson's neoprene taking the beating, not your body.

The Tropical Suit is designed to last. The panels of neoprene are triple glued and stitched with heavy nylon thread. The stitches don't penetrate entirely through the neoprene, thus,



The Henderson Tropical Suit has a zippered farmer john, and the jacket comes with or without a beavertail.

the seams are completely waterproof. The suit is lined with nylon and tough nylon or Lycra fabric protects the more fragile neoprene (on the outside) from snags and tears. The zippers are tough, non-corroding YKK plastic. In fact, Henderson guarantees the zippers for three years. A stick of lubricant is packed with each suit. An occasional light coating will keep the zippers operating perfectly.

The Henderson Tropical Suit is a well-designed combination of good looks, comfort and durability. If you dive where the water is warm, it's worth checking out. It's also perfect for windsurfing and waterskiing. The suit comes in men's and women's styles and custom suits are available. The Lycra jacket and farmer john can be purchased separately for \$124.95 and \$152.95 respectively. The nylon one farmer john is \$95.95. All styles come with a one year limited warranty. For information contact: Henderson, Buck and Sassafras Streets, Millville, New Jersey 08332. ☎

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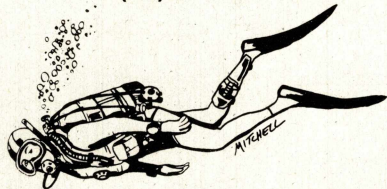
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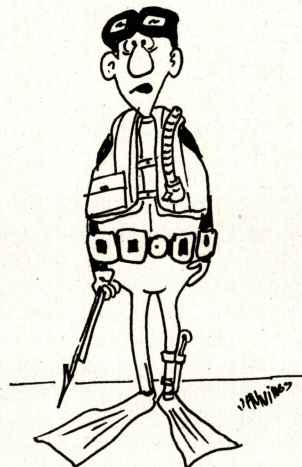
SCUBA STAR II

(Continued from Page 67)

This, too, is quite common of most regulators. Freeflowing characteristics are what would be expected from a high performance regulator: when held away from the mouth, with the mouthpiece up, freeflowing could be started quite easily (by swishing the unit or depressing the purge); and although it would not stop by itself, it could be stopped by turning the mouthpiece down. During this evaluation, the Scuba Star II performed flawlessly. While the regulator was in use I experienced no water leakage, freeflowing, popping, or fluttering — characteristics which are sometimes found on other high performance regulators. If this regulator has any idiosyncrasies, they are not apparent. Early models of the Scuba Star II did have one peculiarity: they tended to vibrate or chatter on inhalation when the second stage was out of water. Underwater, however, this vibration disappeared. A minor modification of the second stage spring corrected the problem on subsequent units. Should you have one of these early versions, and you find this characteristic a little annoying, just request a new spring next time it is serviced.

No special maintenance is required. As with any good regulator, rinsing after use and routine annual service are recommended.

Considering the results of my simple evaluation, the simplicity of the regulator's design, the quality of the materials used in its construction, the reasonable retail price of \$180, and IDI's lifetime limited warranty (which covers any owner, not just the original purchaser), I would highly recommend that you at least compare the Scuba Star II to any other regulator on the market — especially if you are looking for a combination of reliability, low maintenance, economy, and high performance. ➤



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superior diving

TEXT AND PHOTOGRAPHY BY JERRY ELIASON

The 1980 dive season had passed so quickly. Sub-freezing temperatures and a couple of fall storms had kept me out of the water since November. Memories of my previous dives made the first two months of inactivity tolerable, but by mid-January the diving bug was really biting again. What a dilemma: I couldn't afford a trip to tropical waters and ice was already starting to close the shores of nearby Lake Superior. Reluctantly, I prepared my gear for winter storage, unwilling to face the -30°F weather that would be common for the next two months.

Rather than moping around, I started making winter trips to the University of Minnesota-Duluth library and the Lake Superior Marine Museum. Having dived many of the better known wrecks, I was hoping to discover some new and unique potential dive sites. I spent many hours scouring books on lake history and reading old newspapers. The most fascinating story I found that had diving possibilities concerned Silver Islet.

Shortly after the Civil War a vein of silver was discovered on a tiny rock island one mile off the Sibley Peninsula of Lake Superior's Canadian north shore. In spite of the tremendous engineering problems associated with driving a mine that was surrounded by the water of Lake Superior, the vein was tapped to a depth of 1300 feet. The operation was abandoned around the turn of the century when a late season coal shipment wasn't delivered because of early ice. When the coal fired steam pumps went out, the shaft filled with water.

The thought of a dive trip to Silver Islet was made even more inviting when I came across the story of the 256 foot Canadian steamer *Theano*. During a November blizzard in 1906, less than six miles from the abandoned mine, the ill-fated *Theano* struck a rock island and sank. The crew escaped in the lifeboats and later claimed Towbridge Island to be the grave stone of the lost ship. According to knowledgeable divers from Thunder Bay, Ontario, nothing of the *Theano* had ever been found.



Fortunately for three anxious divers the winter was relatively mild and by March the small amount of ice covering the near shore areas of the big lake was breaking up. Larry Race, Kraig Smith and I began making local dives at familiar sites to condition ourselves for the more challenging diving waiting 250 miles up the north shore from Duluth, Minnesota.

The last weekend in April was set for the beginning of a week long trip to explore the submerged remains of Silver Islet. Our departure was delayed by a day when an unseasonal storm dropped eight inches of snow between Duluth and the international border. Tanks, portable air compressor, Uni-suits, assorted dive gear, inflatable boat, 35 hp outboard motor and complete wilderness camping gear were all crammed into Larry's '69 van. Even with the crowded conditions no one seemed to mind; reminiscing about some of our past trips together made the time fly by. On the last 30 mile leg of our trip we encountered two moose, one bear, a timberwolf and maybe half a dozen deer.

Silver Islet was a diver's dream come true. The mine shaft was divable and intact. Near the surface of the 12 by 20 foot opening were huge timbers used for shoring up the completely vertical walls. Looking up and down at a depth of 60 feet I had a distinct impression that this was some sort of interconnecting passage between heaven and hell. Sur-

rounding the 500 foot long island, sunken for many decades, stood the remains of the breakwaters designed to protect the mine and its associated buildings from Superior's occasional 30 foot waves. The deeper areas surrounding the island abounded with mining tools and artifacts. Most impressive was the 30 foot long boiler that had apparently been dumped into the lake and allowed to tumble to its final resting place 55 feet from the surface. Eighty foot visibility contributed to the two days' of Superior diving and photography.

On the third day of our trip we began searching for the *Theano*. Knowing that the waters surrounding Towbridge Island had been searched unsuccessfully, we speculated that the captain and crew may not have known exactly where they had been. We chose to dive a small un-named island two miles east of Towbridge. The vertical rock face of the island extended 55 feet below the water-



line. Assuming that any evidence of a ship striking this island would most easily be found near the island, we began the one mile swim from end to end. Two-thirds of the way along an ominous shadow began forming 80 feet away. I tried hard to talk myself out of believing what I thought I saw. Confusing flat pieces of shale with hull plates had made me cautious. By the time I was 40 feet away there was no doubt, the object was a ship's propeller, about 14 feet in diameter. Upon closer examination we noted that one of its four blades was broken off and missing; the three blades were still secured to a portion of a 12 inch shaft. Nearby we found a solid brass propeller shaft bushing.

On a subsequent dive, only 60 feet from the main section, we located the broken blade of the prop in 120 feet of water. Obviously the rest of the ship must have slide down the 60 degree incline to the 600 foot depths 100 yards away.

The Silver Islet trip was definitely the highlight of my 1981 dive season but close behind were trips to Isle Royale, Whitefish Bay and Munising. Last January I started planning for the '82 season. On this year's agenda is one five-mile long reef in Lake Superior. Would you believe it has collected four wrecks that have yet to be located? ➤

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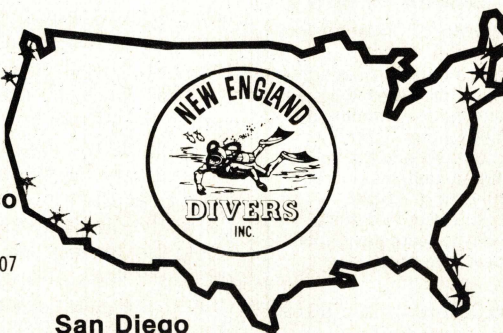
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Salvaging American History

BY MARK J. TERRY

The *Lucius Newberry* was built by Captain Lucius Newberry in 1875 and was launched April 24 of that year. On June 8, 1875, it made its trial run to Kayes Park, Lake Geneva, Wisconsin, and from that time it carried many thousands of happy excursionists. It was the largest steamer ever on Lake Geneva: 115 feet long, 30 feet at the beam, its capacity was easily 700 people. The cabin was a beautiful piece of work, the panels between the windows being oil



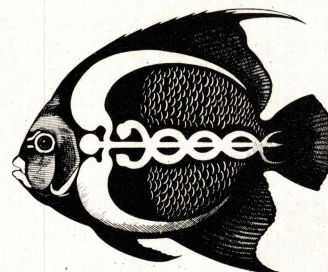
Mark Terry and Ron Steiskal with bell.

paintings by Bullock of scenes about the lake and its history. The steamer cost Newberry \$22,000. After Newberry's death, the boat changed hands several times. Ultimately, it was bought by Wesley Johnson in the spring of 1889 and renamed *The City Of Lake Geneva*.

On December 6, 1891, about 4:30 am, nightwatchman, Frank Taylor, discovered the huge steamer was on fire. The cabin and the back part of the steamer were ablaze. Taylor at once sent in the alarm. The steamer lay at the dock, its stern close to the vessel *Commodore* and Taylor saw at once that the latter boat and the dock itself would soon be on fire, unless the burning steamer could be turned. He therefore cast off the stern lines and a light breeze soon drifted the stern away from the docks. But, just as the firefighters arrived, the bow lines broke free, and the big steamer started drifting out into the lake.

What happened to the proud vessel next remained a secret for nearly 90 years. There would be several full scale attempts to try and find her resting place in the years to come, but it started to look like the ship had been swallowed up by the mud and silt. Old timers around the lake laughed at would-be salvagers,

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claiming the ship's remains had been towed ashore and cut up for firewood shortly after the fire. Some of them said their fathers had told them that the ship went down completely engulfed in flames right in front of the Allerton Estates. Thus, the would-be salvagers searched along the west shoreline in front of the Allerton Estates. But, no evidence of her was found.

On July 1, 1981 I was tired, broke, and wondering why I gave up my job for sal-



Port paddlewheel hubs and driveshaft of the Newberry. Hubs are five feet in diameter.

vaging. The night before a friend, Ron Steiskal, had taken our boat out to look for a small sailboat. He had come back with a read-out on the graph that looked like a small boat. The next morning he and I, along with Bill Ehrhardt, loaded our dive gear and headed out to see if Ron could backtrack. We were about a mile and a half out of Geneva Bay, when suddenly the graph started printing out a huge object below us in about 70 feet of water. We ran over the same spot several times and always came up with the same reading. Bill and I were elected to go down and check it out. We were at about the 50 foot mark when my daydreaming was broken by a shadow below me. I sailed past some standing



Dive team was Ron Steiskal, Bill Ehrhardt, Mark Terry, Janet Uebele and Herb Budd.

posts with steel rigging. I looked down and off to my right I saw two huge discs with a steel rod through them. Suddenly I bumped into something. I looked around and all I could see was steel plates riveted together. I watched Bill as he came down the line and disappeared on the other side of this steel thing. As I rose above the object I tried to figure out what something this size was doing in the middle of the lake. I had turned and started heading back up to those two huge discs I had passed, when a very excited Bill returned and started motioning me to follow him. We started down again, passed the object I had bumped into at the end of my descent, and continued down onto some wood planking. As I looked back down, I realized I was pulling myself along on the huge rubrail of a ship. I looked back at those steel plates and

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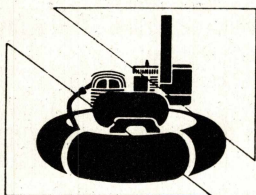
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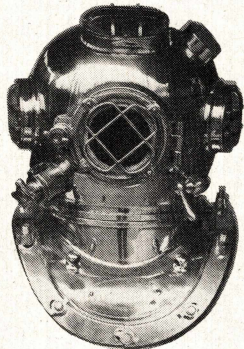


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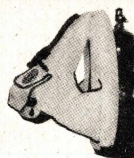
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AMERICAN HISTORY

realized it was a ship's boiler. I bumped into Bill, and as he looked at me, I could see his eyes, with a look I'll not soon forget. He slowly moved out from in front of me so I could see where we were. There it was, at least 20 feet of a ship's bow ahead of me. As we got closer, we could see the bowsprit, mooring eyes and hanging over the rail, just as it had been when she was tied to the docks, was the ship's anchor.

We broke the surface a couple of minutes later, and the first thing I saw was Ron leaning over the side of our boat with the most pitiful look of anticipation I had ever seen.

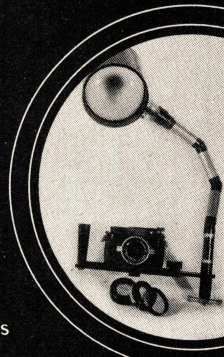


After the second dive, we were sure of what we had, but the first barricade appeared in the form of an unconcerned town council. There would be no official backing of a salvage attempt. The Lake Geneva Historical Society gave us salvage rights, but as we were soon to learn, this didn't mean a thing. So, the work barge was anchored over the wreck of the *Lucius Newberry*, and a 24 hour vigil was set up. We wanted the chance to bring up as many artifacts as we could for donation to a museum. That way this great lady could be preserved forever.

Divers came from all parts of the Midwest to help recover artifacts for history and they all enjoyed their dives on the ship. However, we had our share of those who just drove up, threw an anchor over and prepared to dive. I had an anchor sail past my ear one day while I was down working on the airlift. Thanks to the Lake Geneva Water Safety Patrol and the Lake Police who gave their unofficial support, these incidents became few and far between, and we settled down to the task of recovering lost history.

Bill, Ron and myself were joined by Herb Budd and Janet Uebele. This was the heart of the dive team. The surface support grew, thanks to newspaper and television coverage. Top support was led by Vic Lucas. Greg Kent and Gary Chest-

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nut provided us with a complete underwater slide documentary.

The first thing recovered was the 418 pound anchor, followed by the two handle bilge pump, the windlass, and brass valves. The upper sections of the ship had burned and collapsed on top of the hull or shifted off to the port side. The artifacts from these sections showed the intense heat of the fire.

The work continued, as did the rumors and stories in town. There were still those who said it wasn't the *Lucius Newberry*. It was with a great feeling of satisfaction, when, on August 13, we called a news conference at the waterfront. We pulled out the ship's branding iron (which we had recovered two days earlier) heated it in the coals, and branded a piece of wood, which was presented to Alice D. Hackett, a descendant of Wesley Johnson, the last owner of the ship. The *Lucius Newberry* was officially found.

We brought up beautiful brass and nickel faucets, tools from the engine room, silver spoons, brass fixtures, padlocks and machinery parts. All these items were dug out of the layers and layers of silt and mud that had filled the hull of the ship through the years. The silt had acted as a preservative, because the deeper we dug, the better the condition of the recovered artifacts. From what we could piece together, the ship was completely intact when she headed for the bottom. She had not been stripped of her beautiful fixtures. The final shot in the arm came when melted pieces of silver and bronze started showing up. Then the remains of the bell itself were brought up. It had been one of the most sought after items because it was supposed to have been brought up from Mexico shortly after the Mexican-American War.

Still, not one piece of the wreck had been sold to help us pay for the expedition. Needless to say, after three months, we were getting pretty close to the end of our ability to continue. We were all broke.

Things turned around when Bill and I were at a city council meeting one night trying to plead our case. A representative of TSR Hobbies overheard our plea for help to preserve a major portion of American history. Shortly after that meeting, we were contacted by a representative of TSR named Doug Blume. We were presented a check to cover our expenses and to allow us to continue our recovery efforts. Shortly after that, we received letters from members of Congress and the House of Representatives expressing their support for our efforts.

Thanks to TSR, the Hackett family, and a group of concerned citizens, 4000 pounds of artifacts are now awaiting their final resting place in a museum. Waiting to be enjoyed by thousands of people.

I am currently writing a book. I hope that *Determination on Trial* will tell the whole story about a group of people dedicated to the preservation of American history.

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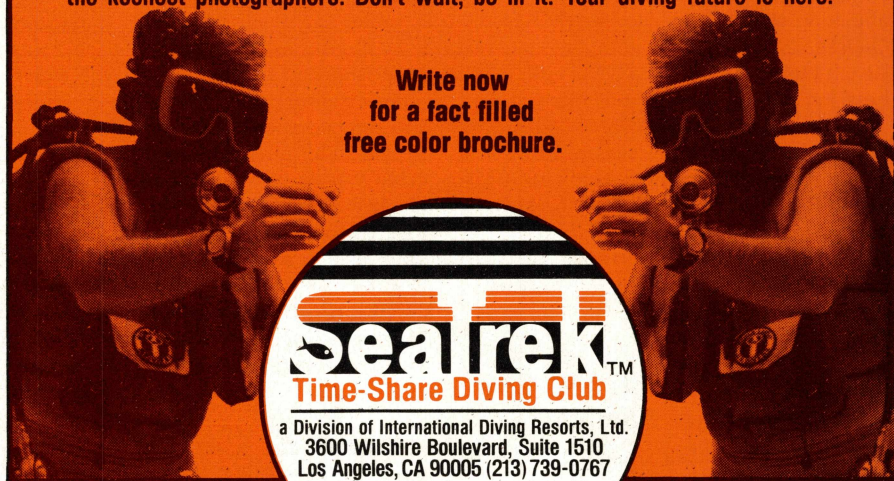
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By Amy Brown

Tahiti

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Tahiti offers a touch of everything for the diver. The luxurious Maeva Beach Hotel features first-class accommodations, close to a multi-hued lagoon with beautiful barrier reefs and a glimmering white beach.

Located on the grounds of the hotel is the island's largest and most complete nautical activity center, Tahiti Aquatique, owned and directed by Richard Johnson, a marine biologist, accomplished underwater photographer and author, and international scuba instructor. Dick and his staff can accommodate scuba enthusiasts, novice through professional, and plan diving itineraries accordingly.

The diversity of Tahiti's underwater realm includes the famed Tahiti Wall, descending vertically into seeming infinity; interesting ship and aircraft wrecks; spectacular soft corals; as well as coral and fish feeding gardens and lagoon and ocean pinnacles. The never-ending variety --seen from Tahiti's average visibility of more than 100 feet on the outer reefs and 50 to 70 feet in the lagoons -- guarantees a truly memorable diving experience.

An optional side trip can take you to Rangiroa, South Pacific's largest atoll, where the bungalow style Kia Ora Village Hotel is set amid languid scenes reminiscent of Gauguin. Underwater, Rangiroa is nothing less than spectacular, particularly in its incredible diversity of fish: thousands of snapper, barracuda, and sturgeon fish, schools of butterfly fish, and a scattering of magnificent eagle and manta rays.

Another practical side trip whisks you to the high volcanic island of Bora Bora, world renowned for its topside scenery of truly breathtaking nature. There one can also enjoy completely rewarding diving, as well as comfortable accommodations in the lovely bungalow style Marara Hotel.

Frequent air service is available via UTA French Airlines from Los Angeles to Tahiti. Land and air reservations arranged by OceanQuest, Inc. 139 Woodlawn Avenue, Upper Montclair, New Jersey 07043. Call toll free 800/526-1394. or 201/744-5254.

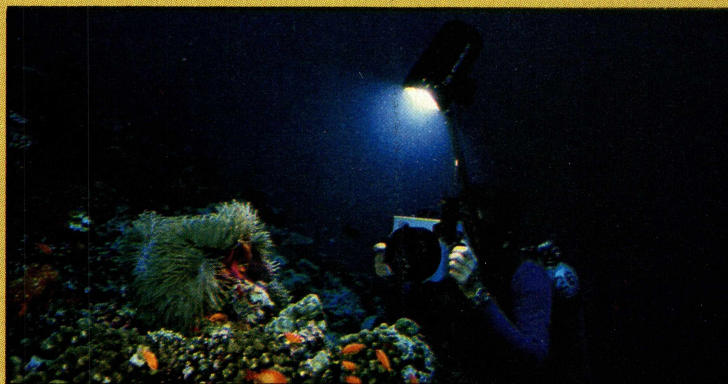
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SECTION

Although virtually unknown to American divers, the Germans call it an island paradise. Its 19 atolls, containing nearly 2000 islands, lie in the Indian Ocean 500 miles southwest of Sri Lanka (Ceylon). Only one in ten islands is inhabited, but some 35 contain tourist facilities, and most of those have dive operations. Its name is the Republic of Maldives, and it offers some of the world's best diving.

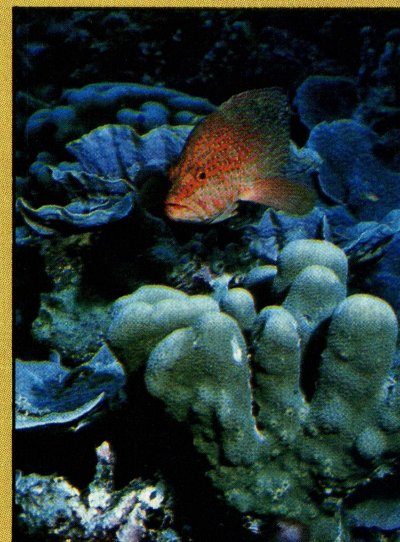
As soon as I saw it from the air, I knew I had made the right choice. The small tropical islands and their



THE MALDIVES

2000 Island Paradise

Text and photography
by Eric Hanauer



fringing coral reefs glittered like jade in an azure sea. As the 727 made its landing approach at Hulele Airport, I could see details of the reefs through the transparent water, and could hardly wait to be down there to see it all at close range.

It didn't take long. Customs officials were thorough but polite. Signs at the airport informed new tourists of the strict Moslem laws. Prohibited are pork products, liquor, drugs and pornographic materials. Satisfied that my luggage contained none of those and giving but a scant glance to my dive and photographic gear, the inspector directed me to the tourist information counter outside. The native language is Divehi, but English is the language of the tourist industry, a holdover from British rule. The young man at the counter was quite fluent, and contacted the dive resort on the neighbor-

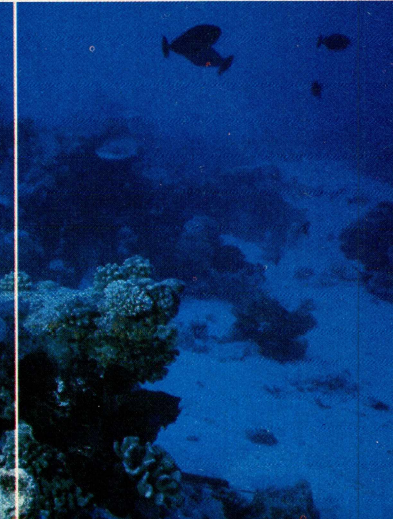
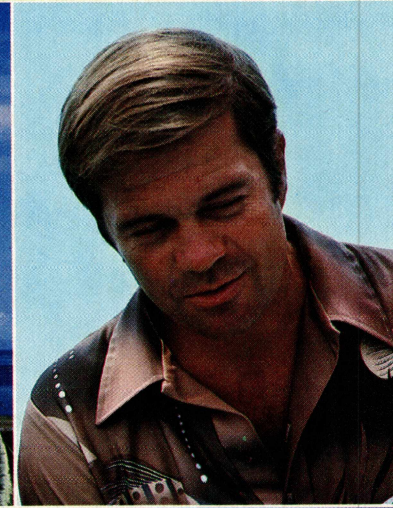
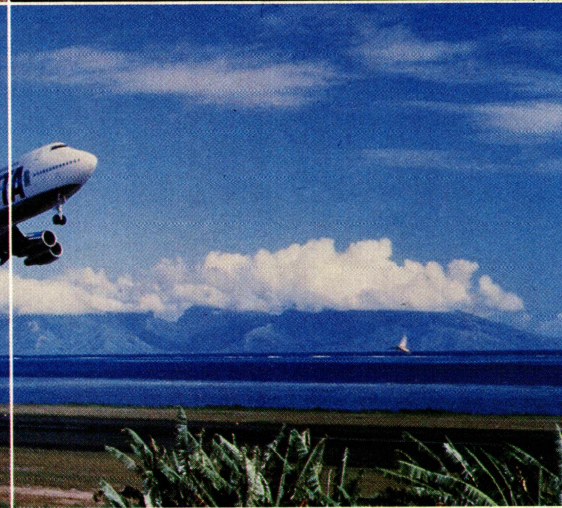
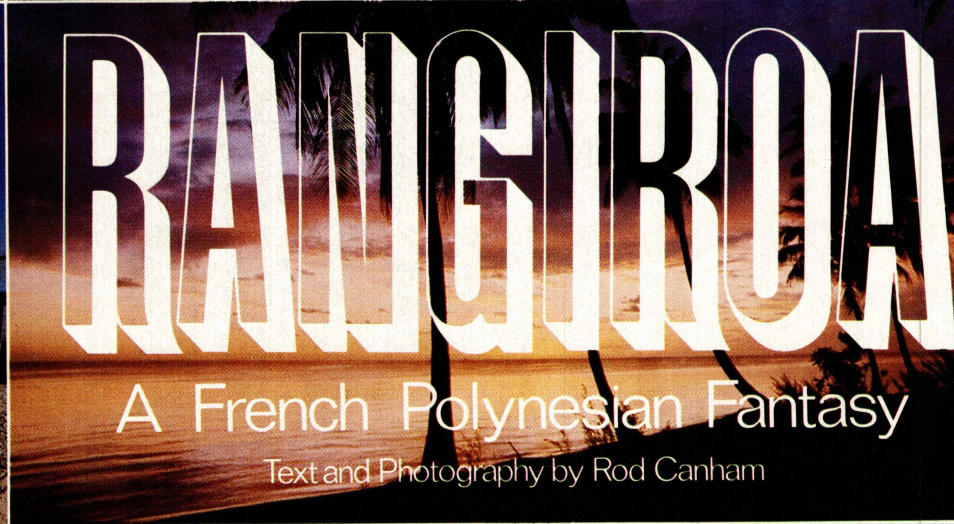
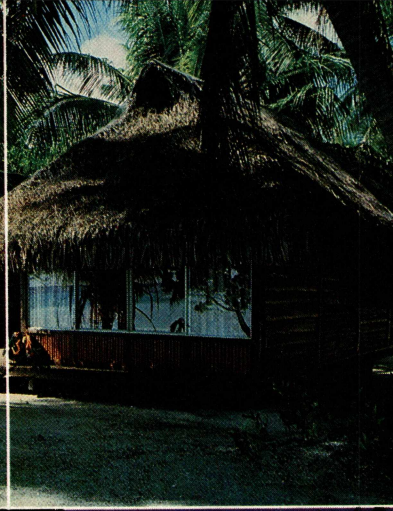
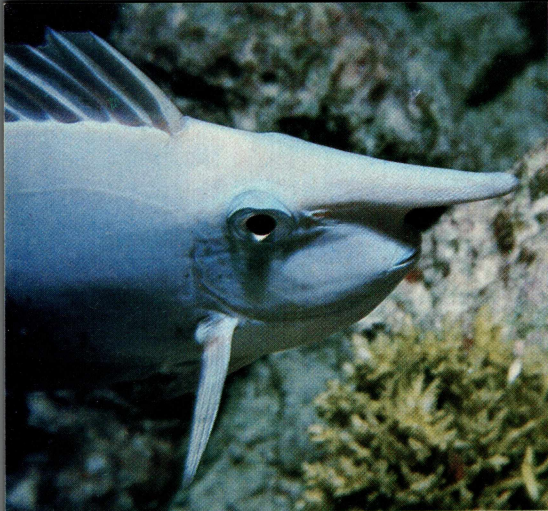
ing island of Villingili by radiotelephone. They soon sent a Boston Whaler and in 20 minutes I was in the lobby of the hotel talking with divemaster Axel Horn.

The hotel lobby is carpeted in fine white sand. Axel, a German who speaks fluent English, assured me that his island had the best diving in the Maldives. If I didn't agree I could move on to another island after a couple of days. Figuring I had nothing to lose, I signed on for a couple of days, then quickly changed into my Speedo for an exploratory skin dive.

The first dive in a new area is always exciting, but this one was special because it was my first exposure to Indo-Pacific marine life. A 150 yard swim from the beach led to the edge of the barrier reef surrounding the island. The familiar parrotfish in the shallows seemed much tamer than those I

was used to. The drop-off's edge, in 10 to 15 feet of water, provided a glimpse of a new and different underwater world. Large table corals furnished hiding places for brilliantly colored fish. Anemones, tinged green by their commensal algae, covered entire mounds of coral. Orange clownfish peeked in and out among the tentacles. Large *Tridacna* clams gaped at me with their perpetual crooked grins. Feathery crinoids perched delicately on coral ledges and soft corals

(Continued on Page 100)



Since the mid 18th century, the islands of French Polynesia have been sought by travelers looking for the pleasures of a South Pacific paradise. They found in its lush green volcanic islands the embodiment of their utopian fantasies. With serene, turquoise-blue lagoons, isolated beaches, beautiful sunsets and balmy evenings, French Polynesia's acclaim is unrivaled anywhere in the world. Alluring tropical delights are called to mind by the very mention of such familiar names as Tahiti, Moorea and Bora Bora. But, with over 120 islands spread about an ocean area the size of Europe, French Polynesia is much, much more.

Halfway between Sydney, Australia and Los Angeles, California, the French Overseas Territory of French Polynesia consists of five archipelagos; the Australs, Gambier, Marquesas, the Society Islands (of which Tahiti is a part) and Tuamotu. These island groupings are the peaks of ancient volcanoes. Part of the Tuamotu archipelago, Rangiroa is the second largest atoll in the Pacific (42 miles by 14 miles) and was rated by SKIN DIVER Magazine (September 1973) as one of the ten most exotic diving vacations in the world. It's difficult to hold back superlatives when describing its dive offerings.

After an eight hour flight aboard the UTA Air France 747 from Los Angeles, we landed at Papeete, Tahiti and transferred to an Air Polynesian Twin Engine Turboprop for a one hour flight to Rangiroa.

Located 200 miles northeast of Tahiti, our final destination was Kia Ora Village situated on the northern tip of the atoll. Kia Ora (meaning welcome) was constructed in 1973. Built in a coconut grove, the secluded charm of its 25 thatched roofed bungalows and white sand beaches may be misinterpreted as Spartan accommodations, but nothing could be farther from the truth. These are superior rooms with modern furniture, comfortable beds and first class facilities. The front of the bungalows have wrap-around decks for equipment drying, and sliding glass windows, the width of the cottage, overlook the lagoon.

Meals served in the comfortable, open air dining room are a blend of Polynesian and continental cuisine. Buffet style breakfasts comprised the morning offering while pm entrees ranged from local fresh fish to *quiche Lorraine*. The ever present French bread accompanied all meals and delectable pastries provided *le coupe de grace*. Baked Alaska served on a tropical island in the middle of the South Pacific was an unexpected delight.

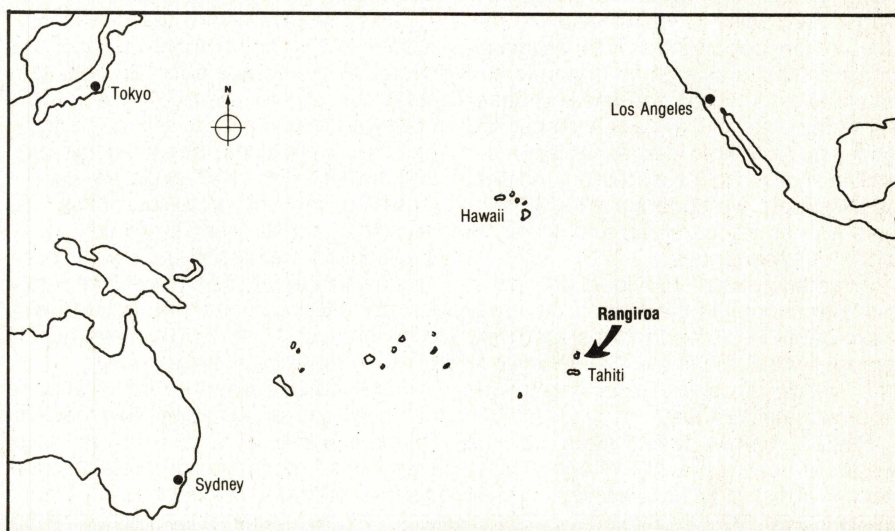
The over-water bar at Kia Ora Village is the greeting point for all incoming guests. Welcoming cocktails may be

enjoyed on the large deck adjacent to the bar, and most newcomers quickly discover the large in-water shark pen at the edge of the deck. The 12 docile sharks which inhabit it serve notice to the heart-thumping action we were soon to experience beneath these gentle waters.

After loading our gear we rode to our first dive site. The three dive boats were small (six divers per) but quite fast. A ten minute ride brought us to the most easterly pass. Tiputa is one of two passes which, spaced six miles apart, border this tiny islet and host a unique blend of calm, shallow waters, outer coral reefs,

periences with sharks. Dick Johnson is an American expatriot living in Tahiti with his wife and five year old son. He owns and operates an aquatics concession at the Maeva Beach Hotel and accompanies dive groups on out-island expeditions.

Besides his instructor ratings from NAUI, PADI and CMAS, Dick brings an unusually broad background in shark behavioral research. After three years in the Navy, he received his Bachelor of Science degree from California State Polytechnic University, Pomona, and Master of Arts from California State, Long Beach. He specialized in shark behavior-



Rangiroa, the second largest atoll in the Pacific (42 by 14 miles), is part of the Tuamotu archipelago. An hour's flight from Tahiti, Rangiroa is a must when visiting French Polynesia.

visibility in excess of 150 feet and exciting drift dives.

Underwater, the outer reefs are a veritable catalog of Pacific hard corals. Leaving no spot uncovered, these colonies span the full range of our vision. Sloping gently from 35 to 80 feet, the reef radically drops off to the depths. The constant parade of pelagics, swarms of schooling fish and territorial tropicals darting about provide an awesome spectacle, even for the most seasoned diver.

French Polynesia offers a wide variety and startling abundance of fish. Seemingly endless schools of surgeonfish, barracuda, jacks and unicorn fish pass by in the gentle currents searching for food.

Colorful angelfish, damsels and more than 75 varieties of butterflyfish comprise a small percentage of the indigenous aquatic populace. Add frequent visits by spotted eagle rays, mantas and docile sharks, and we had all the ingredients for electric diving. All too soon we found it necessary to return to the surface.

Evenings were spent relaxing at the patio bar, reminiscing daily activities and recording the typically photogenic sunsets. Dinner conversations often centered around our dive guide's expe-

al research which eventually led him to the South Pacific. In 1972 Dick was named the on-site expedition leader by the Office of Naval Research and National Geographic Society. His ten years of study in this field has produced the book, *Sharks of Polynesia*.

Visiting divers profit from Dick's background. He readily draws upon his first hand experience, providing an informal education about sharks and fascinating entertainment. Our false bravado and misguided anxieties were soon replaced by the anticipation of diving with these maligned creatures.

In the morning we boated to a site near Avatoru Pass called Mahuta (meaning, dividing of the currents). Owing to the underwater topography, it was an ideal spot for observing sharks, with water depths from 45 to 60 feet and visibility of more than 60 feet. Our group settled along the reef-lined perimeter of an open area. With cameras ready, we watched while Dick set the stage for an unforgettable dive.

As with most close-up fish observations, the key word was food and freshly speared surgeon and snapper were provided. Positioned upstream in the current, the bait was cut open to establish an

RANGIROA

"odor corridor." Within minutes the first whitetipped reef shark came into view. Cautiously making its way toward the source of smell, the shark approached us. Its instinctive drive for food caused it to enter this arena of flashing strobes, air bubbles and subsurface humanity. The shark was shortly joined by several of its fellow species as well as blackfin and gray reef sharks.

Sightings of Javanese moray eels, huge Napoleon wrasse and spotted eagle rays paled in comparison to this uncommon opportunity. With estimates of up to 30 sharks sighted, trying to see all that was going on and seeking better vantage points for filming established the priorities. At no time was fear a part of the activity. Following the lead of our resident shark expert, we surfaced after 50 minutes with empty cameras and a lifetime worth of experiences.

An interim break provided an opportunity to snorkel in the lagoon. Its maximum depth is 82 feet and it slopes very gradually from the shore. Seventy-five to 100 yards off shore, the depth was approximately 25 feet.

Readily visible coral heads dot the waters in front of Kia Ora Village. A wide variety of fish and invertebrates inhabit

the many isolated reef heads. Free-growing mushroom corals, sea cucumbers, stonefish and an abundance of Christ-mas tree worms fill the shutterbug's fancy. The excellent shelling and easy access make it a delightful experience for all.

Later, a return to the ocean side of Tiputa Pass allowed us to take a drift dive in nine knot currents. During the incoming tidal cycle, the water flow passes between the two islets creating a venturi effect. Descending together, our group stayed in visual proximity as we effortlessly drifted through the shallow waters. Since we trailed a surface buoy, the dive boats easily tracked our rapid progress.

Efforts to divert from the direction of water flow proved fruitless, and the secret of "going along for the ride" was soon discovered as participants were observed in a variety of sitting, standing and flying positions. Owing to the high concentration of food supplied by the incoming tide, the profusion of fish was truly spectacular. We viewed schools of surgeonfish blanketing the ocean floor. This living carpet of fish would separate for our fast approaching divers. With comparatively little effort, rays would glide by leaving all spellbound.

Our eventual departure from Rangiroa came all too quickly. We flew back to Papeete, Tahiti for a day and a half of sightseeing, shopping and relaxation. A six mile ride from the airport took us to the

Hotel Tahara's. Built in 1967, this inverted facility was constructed up the side of historic One Tree Hill. The lobby, with its Polynesian decor, is located at the summit while its ten floors cascade down the side of the mountain. Its 200 balconied rooms overlook Matavai Bay where the 18th century explorers Wallis, Bougainville, Cook and the infamous Bligh sought safe anchorage in its protective waters. From here guests may also view Tahiti's volcanic black sand beaches, the island of Moorea, and Tahiti's capital city, Papeete. With its restaurants, boutiques, car rentals, island tours and shuttle buses, the hotel provides all services necessary to visiting travelers.

A recommended itinerary for travel to French Polynesia includes an initial two days on Tahiti. The wall dives and in-harbor wreckage of a schooner and PanAm PBY are interesting, and a good warm-up. Five or more days should be spent on Rangiroa for the aforementioned diving. A return to Tahiti for two days of sightseeing and shopping or options to Bora Bora would round out a thorough visit.

In circles where familiar destinations like Bonaire, Palau, the Caymans or Truk Island are recommended for dive travel, Rangiroa should be included as a must.

Travel arrangements may be made by contacting Art Travers at Poseidon Ventures Tours, 359 San Miguel Drive, Newport Beach, California 92660; (714) 644-5373.

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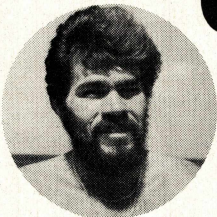
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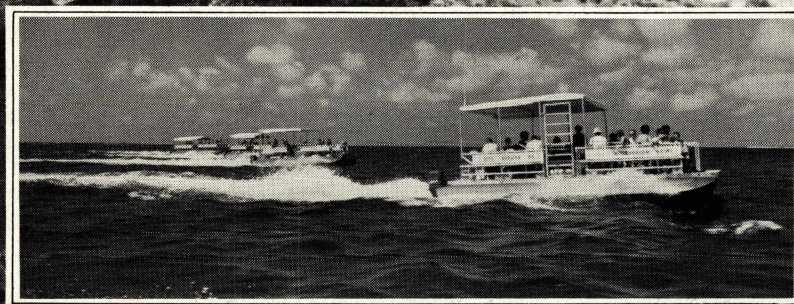
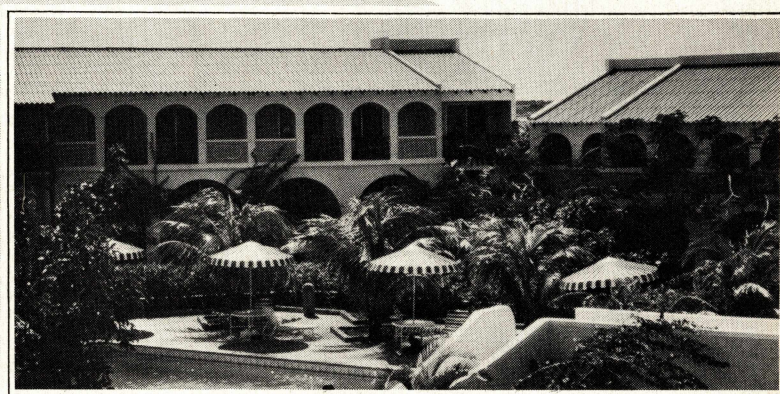
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Peter and Alice Hughes, Dive Bonaire, have a new boat. In early February the vessel made her maiden voyage to Klein Bonaire. Among the guests of honor on board were such well known personalities as Buzz Aldrin, Paul Tzimoulis and



Dr. Jeff Davis. The 31 foot Critchfield, built by Sabre Marine Inc. in Orlando, Florida was christened the *Solar Rainbow*.

The boat has a 10 foot beam providing lots of space for diver comfort and convenience, and is powered by two 200 hp Mariner motors generating speeds of 35 knots. Hughes stresses, "The addition of this sixth dive boat is not to enable us to handle more divers on a daily basis, but to give us much more versatility and to further streamline our operation."

For more information about the newest addition to Dive Bonaire's operation at the Flamingo Beach Hotel, please call toll free (800) 847-7198 (in New York State call toll free (800) 252-6323). Or, write to Dive Bonaire N.V., Flamingo Beach Hotel, 520 West State St., Ithaca, NY 14850.

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Dive shops and clubs which plan trips to the Caribbean are the target of Caribbean Adventures' new 365 plan. The plan allows the club or shop to sign up divers on an individual basis for any of Caribbean Adventures' special packages. Trips will not be canceled, even if only two divers sign up. This will allow shops and clubs to increase diver participation in such trips through the knowledge that once signed up, they are assured of the desired trip on the desired dates.

Caribbean Adventures also searches out the lowest air fares to the destinations scheduled.

This year Caribbean Adventures is offering packages to Haiti, Jamaica, Bahamas, Cayman, Virgins, Bonaire, Turks and Caicos, Mexico, and Belize. For more information contact Caribbean Adventures Ltd., Suite 4, Land O'Lakes Plaza, P.O. Box 685, Land O'Lakes, Florida 33530. Telephone numbers are: Tampa — (813) 996-4944; Florida — (800) 282-9178; Nationwide — (800) 237-3803.

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Romora Bay Club

A Diver's Haven For Romantics

Text and Photography by Rick Frehsee

Roy Schmidt is a handsome bear of a man who looks more like a young football coach than the owner of one of the most beautiful little out-island resorts in the Bahamas. Recently, over rum punches served at his spacious Romora Bay Club on historic Harbour Island, he related how it had begun. "I came to this island on a holiday vacation in 1963, fell in love with this property, met my future wife, proposed to her and bought this place — all in six days." Then he added, with deep reverence in his voice but a twinkle in his eye, "On the seventh day I rested."

He didn't rest for long. Romora Bay is well-planned and beautifully kept without being too formal. Roy and his lovely wife, Moyra (Roy plus Moyra equals Romora) have made the development of their resort an ongoing challenge and pleasure which is evident to everyone who visits this eastern Bahamas paradise. Lovingly fashioned from a former Bahamian estate on the bayside of narrow Harbour Island, the sprawling grounds of cottages, bungalows and time-share units is partially hidden in a lush tropical forest of noble palms, slender Australian pines, poinciana, sea grapes, hibiscus, crotons, bougainvillea, and an orchard of orange, lime, lemon, breadfruit and avocado trees. The dining room, a makeover of the original main house of the villa, is where breakfast is served inside or outside on the patio and where exquisite dinners are served in the well appointed and romantic inside dining area. On the bayside, the resort reaches out into the lagoon with a dock and an outdoor lounge that serves as a gathering place for watching rosy sunsets in the early evening. To the east, the property extends all the way to the oceanside where a white sand beach and snorkeling area are available. Accents such as a hot tub, hammocks, patios and winding paths complete the atmosphere.

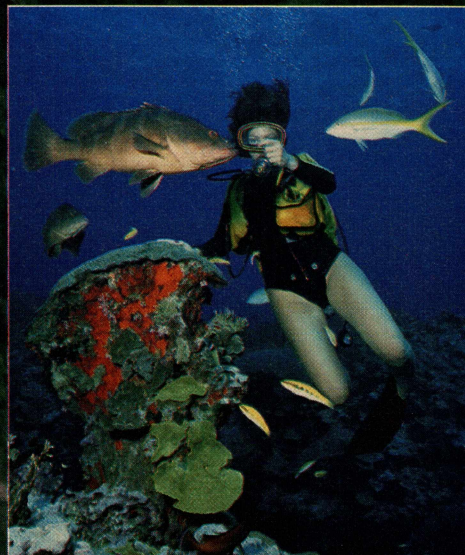




Feeding young bluehead wrasse at the Train Wreck.



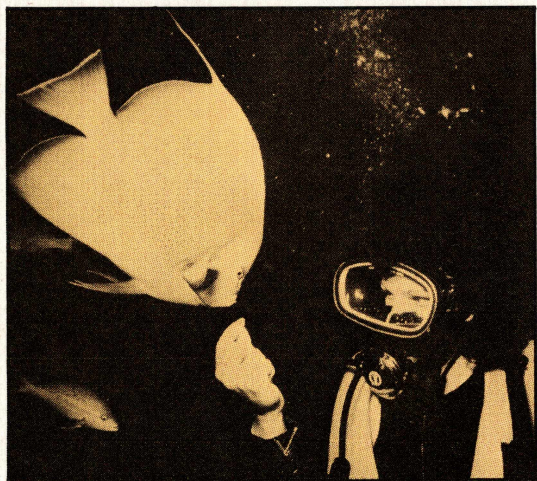
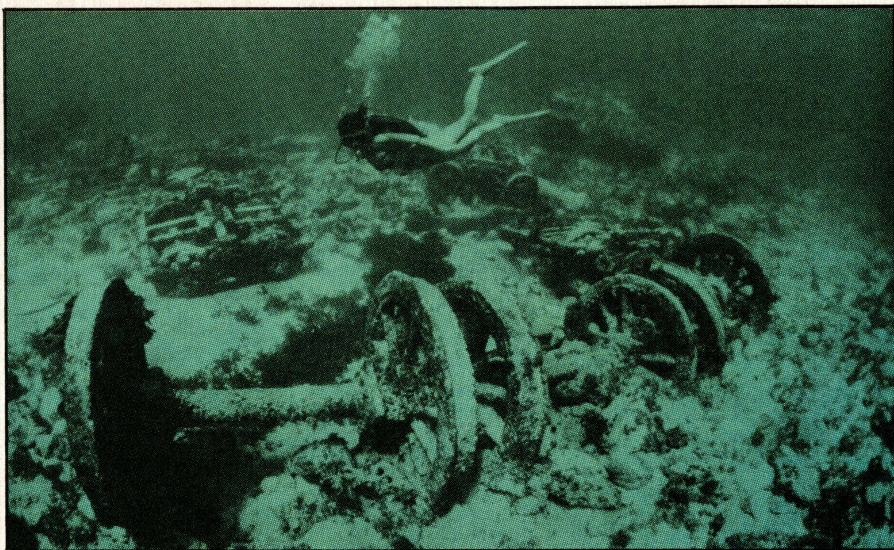
Fish feeding above the Plateau on the eastern side of Eleuthera.



A friendly Nassau grouper at the Plateau.



Shipwrecks and white sand beaches abound on the north end of Eleuthera.



Above, the wheels and axles of the Train Wreck are a major attraction off the north end of Eleuthera. The train was on its way to a Cuban sugar plantation in 1865 when it toppled off its barge during a sudden storm. Left, a gray angel gets a snack.

In view of the relaxed elegance, it is fair to say that the Romora Bay Club is not essentially a diver's retreat. However, it is very well equipped to handle single divers and groups of 20-30 divers. In the early days of Romora, Roy (NAUI Instructor #1999) used to take out a few divers at a time in his 15 foot run-about. Today the club has two full time dive instructors, Jeff Fox, formerly of Cayman Brac and Roger Ironside, from New Zealand. The dive operation depends on a fleet of custom boats including a 31 foot diesel charter boat, a 25 foot Delta, and a 19 foot outboard. Air, tanks, and rental gear are housed in the dive locker located at the beginning of the dock.

The underwater environment available to Romora Bay guests is diverse and extensive. Two major areas, one at the north end of Eleuthera and the other to the east of Harbour and Eleuthera, are within a half hour of the resort and provide a choice of locations. The reefs, fish life, visibility and wreck sites are in keeping with the best of the Bahamas with only deep vertical drop-offs missing. The highlights include active fish feeding stations, historical shipwrecks, and huge

coral and rock formations.

The Devil's Backbone is the primary reef system which forms an almost continuous barrier of coral along the north end of Eleuthera. Often billed as one of the most extensive reefs in this part of the world, the Backbone is well formed, the fish life abundant, and the shipwrecks almost as continuous as the reef itself. Shipwrecks, of course, are almost common undersea attractions in many areas of the Bahamas and Caribbean, but undersea trainwrecks are a north Eleuthera specialty. The train was captured from the Union by the Confederates during the Civil War and was on its way to a Cuban sugar plantation when it toppled from its barge in a sudden storm. That was in 1865 and today the most recognizable parts consist mainly of three solid steel locomotive wheels and three smaller sets of wheel trucks which are strewn across the bottom as if some giant infant had tossed a toy train aside in a temper tantrum. The wreckage has grown a beard of brown algae, purple seafans, and soft seaweeds which wave back and forth in the gentle swells. Sunlight sends rainbow ripples across the bottom which are complemented by the flashing move-

ments of 100 small tropicals. The best dives on the train wreck are during periods of comparative calm and during high tide when the visibility may approach 100 feet.

Less than one-quarter mile from the train wreck is a conglomerate of multiple shipwrecks that has puzzled even the experts. The largest wreckage is that of the *Cienfuegos*, a 200 foot New York-based passenger steamer that crashed on the reef in 1895 during a winter storm. The wreckage, which lies in depths from 10 to 35 feet, includes two large heat exchangers, a big boiler, the main drive shaft and a large area of steel plates, broken ribs and twisted steel beams. The *Cienfuegos* was actually discovered by local divers who were exploring the trough through the coral made by a more recent shipwreck — the *Onion and Potatoes* wreck. This 85 foot coastal freighter, the *Vanaheim*, with a cargo of vegetables, ran into the Devil's Backbone during a storm in 1969. The incredible force of the heavy seas pushed the small freighter up and over the reef barrier, digging a trough all the way to shore. Today, part of the wreckage lies high and dry on the white sand beach. The trough plowed by the *Vanaheim* runs directly over the bow of the *Cienfuegos*.

There are two or three other shipwrecks within 200 yards of this site and several others within a half mile. The Devil's Backbone is a ship pilot's nightmare and a wreck diver's dream.

On the eastern, or seaward side of Harbour Island, and north Eleuthera is a completely different kind of topside and reef environment with greater average visibility. High cliffs and limestone bluffs of sedimentary and coral rock make up the craggy shoreline. Here, ironshore and scrub pine accent the landscape where rugged terrain meets an equally rugged rolling sea. This is V-boat territory; no flattop dive boats could handle this side on less than a good day. Divers with a fair set of sea legs, however, will be rewarded with some uncommonly good diving.

About five minutes south of Harbour Island is a dramatic shallow dive site next to shore under a rocky cliff. The location is identified by a bridge over the narrowest point of Eleuthera island known as the Glass Window. The sea floor is made up of giant rock boulders which have broken off from the island proper and the steady pounding of the sea has produced many strangely sculptured formations and deep potholes etched in the rock.

Another five minutes southeast of Glass Window is perhaps the most dramatic deep reef area easily reached from Romora Bay. The Plateau is actually a large area made up of a series of high rolling coral ridges and alternating canyons which rise out of more than 100 feet of water to within 35 feet of the surface. The ridges are mainly made up of high density live coral capped with frothy sea-

whips, large purple seafans and colorful incrustations of sponges and hydrocorals. The featured hard corals are various species of brain, lettuce, star, starlet and finger corals with several large, impressive fields of staghorn coral. It's a real kick to glide through the clefts in the reef which open up to the huge canyons below.

The big change that has taken place since our last visit to Romora Bay nearly two years ago is the dramatic increase in fish life on the Plateau. In response to constant hand feeding by Romora's divers, numerous groupers, grunts, snappers, triggers, angels and coney have swarmed over the reef. Aggressive fish feeding stations have become very popular at many dive resorts throughout the Bahamas and Caribbean and this is one of the best. A diver is besieged with so many fish that it is difficult to react to any one individual. The fish are experts at keeping your attention while deploying a sneak attack from the rear. The angels will stare directly into your facemask, the triggers will nip at your gloves and the grouper will actually leap into your BC pocket. There's a thrill a minute on the Plateau and some table scraps skillfully hidden in an opaque bag or a jar with a lid is all that's necessary to play the part of an underwater Pied Piper.

Topside activities on Harbour Island are obvious and plentiful but they are eclipsed by the historic charm of quaint Dunmore Town and the beauty of the island and the people who live here. Before Nassau, Harbour Island was the political and social center of the Bahamas, but there has been no attempt at modern commercialism. Harbour is the third most popular island with tourists, after New Providence and Grand Bahama. However, I have never seen it crowded.

Topside, Romora Bay has as many pleasures as its underwater counterpart. The food is excellent, a combination of Bahamian specialties and continental cuisine. And, a pleasant stroll through the groves and grounds after a good meal is always in order. Francis, the adorable resident donkey, is there to beg a table scrap (he's worse than the grouper on the reef) and that Romora Bay specialty, the X-rated picnic is fast becoming an institution. Billed for pre-honeymooners, honeymooners and re-honeymooners; a water taxi will leave you on a special secluded island with you and yours, a jug of wine and your imagination.

Is Romora Bay a honeymooners' haven that features diving or a divers' haven for romantics? It makes little difference for the end result is one of the most beautiful and spontaneous holidays of a lifetime.

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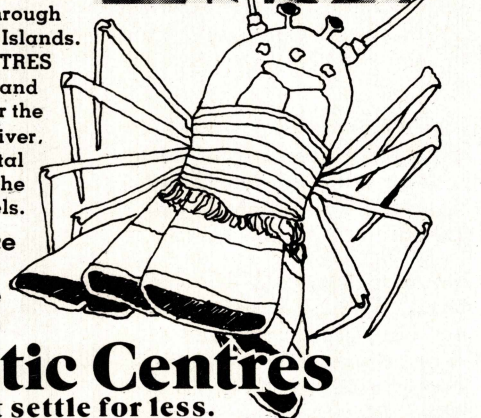
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THE MALDIVES

(Continued from Page 89)

lent a blaze of surreal reds, oranges and yellows. Large schools of fish darted around. Off in the distance hovered a huge fish with protruding lips and a bump on its forehead. I learned later this was a Napoleon wrasse, which can grow in excess of 400 pounds. In the days to come we were observed from a distance by several of these colorful creatures, but they were never close enough to be captured by a frustrated photographer's lens.

An *apres* dive visit to the hotel bar furnished an opportunity to meet some of the other guests over a cold beer. (Fortunately, Moslem law looks the other way where the tourist industry is concerned.) It seemed like a meeting of the European Common Market, with Germans, Austrians, Italians, and French in attendance.

In subsequent days I gained a great deal of respect for the German divers. They were extremely competent in the water, whether it involved depths, currents, or choppy seas. They explained that 40 supervised dives are required for full certification in their country, and the ones who traveled here took their *tauchen* (diving) seriously.

During the week that followed I made many memorable dives; shallow and deep, day and night, from the beach and from boats, on Villingili, Embudu, and Bandos islands. Looking back through my log book, fleeting pictures return to mind: the strange unicorn fish; the deep caves with colorful soft corals and gorgonians growing from the ceilings; the gray reef sharks occasionally in the distance; and the beautiful clown triggerfish.

We made a side trip to Bandos to watch Herwarth Voigtmann's shark show. Voigtmann, a former circus lion tamer, now takes his performance underwater where he and his scantily-clad female assistants feed sharks in a natural amphitheater complete with seating and a coral head stage.

As with any remote area, some inconveniences can be expected. The accommodations won't make five stars in the Michelin Guide and neither will the food. The dive boats can be small and crowded. Things don't always go as planned, or on time. The seas may be rough, the currents strong and the dive-masters not as attentive as those in other areas. There are stinging critters, both on land and underwater. But when you watch the sun set after a great day of diving, none of those things matter.

For the American diver, going to the Maldives isn't quite as easy as heading

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for the Caribbean. For one thing, it's half-way around the world. For another, not many travel agents book trips there. A look at the travel brochures tells you why. They are written entirely in German. Sub Aqua Tours, based in Munich, books travelers into nine of the area's 23 dive operations, most of them on North Male and South Male atolls. It is also possible to book passage on a charter boat for dive trips to those islands and to some of the outlying atolls as well. One American travel agency, Bay Travel of Corona del Mar, California, is concentrating on the Maldives as one of its prime diving destinations. Carl Roessler's Sea & Sea agency has also booked Maldives trips for the past few years. 🐠

TRUK/PALAU PHOTO TOUR

Photographer Stephen Frink will run his Second Annual Photo-Tour, in conjunction with Poseidon Venture Tours, to the South Pacific islands of Truk and Palau. Departing October 22 and return-



ing November 6, the Truk/Palau tour will include the wrecks of the Imperial Japanese Fleet in Truk Lagoon, the coral reefs of Truk, and the drop-offs and reefs of the Palauan archipelago. For further information please contact Stephen Frink Photographic, P.O. Box 1907, Key Largo, Florida 33037. 🐠

SPORT TOURS MOVES

Sport Tours, a dive tour operator for over four years, has moved to: 305 Alcazar Ave., Coral Gables, FL 33134. The move offers better service and more room for future expansion. Sport Tours offers dive packages to: Roatan, Guanaja, Belize, Grand Cayman, Cayman Brac, Jamaica, Andros, Bonaire and the Turks & Caicos. Along with dive vacations it also offers hiking, white water rafting and sailing vacations. Sport Tours operates as a retail agency as well as a tour wholesaler. 🐠



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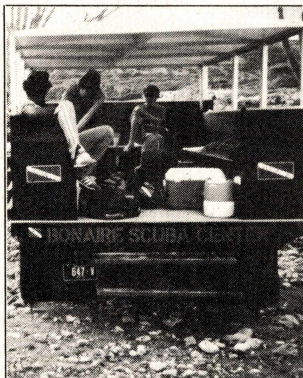
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Sail 'n Dive Australia is a joint venture between two Australian companies which have been involved in tourism on the Great Barrier Reef since 1978. John Landau of Whitsunday Yachting World and David Loughnan of Dive in Australia feel that Australia has a great deal to offer North American adventure seekers.

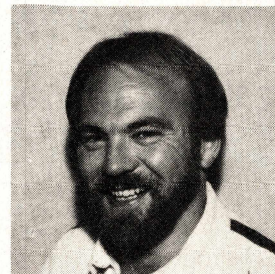


Heading the new North American office is Toni Gliem, an experienced sailor and certified diver with a substantial background in the travel industry. Toni's affinity for Australia began while she was representing Whitsunday Yachting World in the offices of Windward Leeward Sailing Tours, and has grown with each successive familiarization tour of Australia and its Great Barrier Reef. Her commitment to Australian tourism will help her assist persons wishing to experience sailing the Whitsunday Islands and/or diving the Great Barrier Reef/Coral Sea.

The new office for North America is located in the Wharfside Building at 680 Beach Street, Suite 498, San Francisco, CA 94109 and any telephone inquiries can be directed to (415) 928-4480.

MORRISON TO RIDING ROCK

Don Morrison has joined the staff of divemasters at the Riding Rock Inn, San Salvador Island, the Bahamas. Formerly from Los Angeles, California, Morrison is



a veteran diver of 12 years. He has logged dives in Mexico, Florida, Tahiti, California and British Columbia, and has extensive freshwater diving experience in inland lakes, rivers and sink holes.

Morrison is a recent graduate of the

St. Thomas IN THE U.S. VIRGINS

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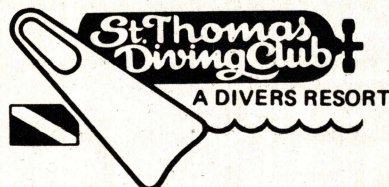
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Villa Olga—PADI Training headquarters and home of St. Thomas Diving Club, new rooms, pool.

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For information, write

St. Thomas Diving Club

P.O. Box 4976, St. Thomas, U.S.V.I. 00801

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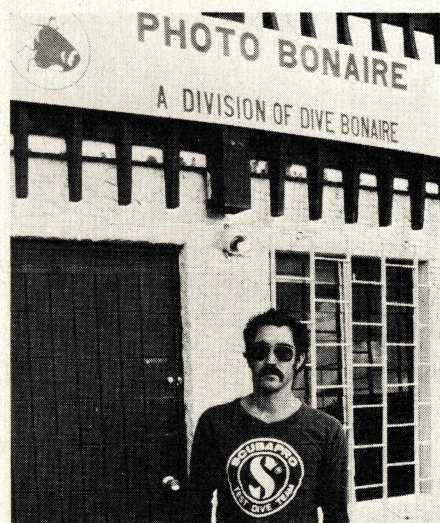
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PADI International College of San Diego, California. He received his Gold graduate certification in March 1981. His qualifications include first-aid instructor, advance life saving, CPR, open water scuba instructor, specialty training in equipment repair, underwater photography and search/rescue diving. Prior to joining the Riding Rock Inn staff, Morrison was co-owner of Aquatic Adventures, a diver training facility located in Florida.

Morrison's responsibilities at the resort will include basic scuba training for beginning divers as well as serving as divemaster and underwater guide for daily boat trips. 🐟

McLAUGHLIN TO PHOTO BONAIRE

Peter and Alice Hughes of Dive Bonaire, the Flamingo Beach Hotel, have appointed Chris McLaughlin as manager of Photo Bonaire. Photo Bonaire is a full service underwater photo facility on the grounds of the Flamingo Beach Hotel adjacent to the dive shop. It offers a one day introduction to underwater photography course and a full two day underwater photography course. In addition, Photo Bonaire has available a full line of rental



underwater cameras, strobes, lenses and accessories. A color lab on the premises offers daily color processing of E-6 (Ektachrome) film.

Among his most important functions as manager of Photo Bonaire, Chris will be teaching both underwater photography courses. Bonaire has an incredible variety of small creatures and rich coral growth, thus macro and close-up photography will be emphasized. Dive Bonaire also hosts the Rick Frehsee Underwater Photography School four times yearly.

More information can be obtained by writing Photo Bonaire, Flamingo Beach Hotel, Bonaire, Netherlands Antilles; or 520 West State Street, Ithaca, NY. Call toll free (800) 847-7198, or in New York State toll free (800) 252-6323. 🐟

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FISHEYE PHOTOGRAPHIC

A new U/W photo center has opened on Grand Cayman. South of Georgetown, near Casa Bertmar, Fisheye Photographic Services will offer a full line of rentals, sales, instruction, repair, and four hour slide processing (E6).

A half-day photo resort course, in which instruction and a shallow shore dive are combined to put the diver be-



hind a camera, is a special feature designed especially for Fisheye by co-owner/manager Martin J. Sutton. Film from the course is rush-developed and critiqued by Sutton and U/W photographer Ahuva Zaid.

A custom designed photo boat departs each morning and afternoon for Cayman's fishiest offshore reefs, and on board, to help photographers, is a photo instructor/divemaster.

For full details write to Martin J. Sutton or Ahuva Zaid, P.O. Box 637, Grand Cayman, B.W.I.

ALM BONAIRE NONSTOP

ALM Airlines has added a nonstop DC9-30 Friday afternoon flight to serve the island of Bonaire. Flight #972 will leave Miami International Airport at 3:30 pm (EST) Friday, arrive in Bonaire at 7:15 pm and then continue to Curacao.

Bonaire has previously been served nonstop by ALM only on a Saturday flight, although there are regular connecting flights to Bonaire from Curacao and Aruba on a daily basis.

The new flight to Bonaire was instituted by ALM because of the island's increasing popularity, particularly among underwater enthusiasts. ALM expects the Friday flight to be even more popular because of the earlier arrival time and the fact that it will give Bonaire travelers another weekend day on the island.

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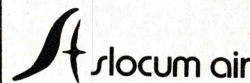
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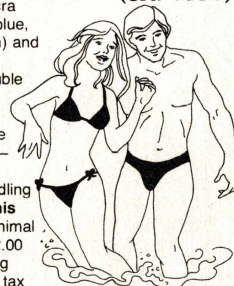
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3. What size is it? A ☐ 8-10 Ft B ☐ 11-20 Ft
4. What size motor do you have on board your inflatable boat?
1 ☐ 2-4 HP 3 ☐ 12-24 HP 5 ☐ Do not have a
2 ☐ 5-10 HP 4 ☐ 25 HP and over motor on board
5. Do you use your inflatable boat for diving?
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2. Do you own an inflatable boat? A ☐ Yes B ☐ No
3. What size is it? A ☐ 8-10 Ft B ☐ 11-20 Ft
4. What size motor do you have on board your inflatable boat?
1 ☐ 2-4 HP 3 ☐ 12-24 HP 5 ☐ Do not have a
2 ☐ 5-10 HP 4 ☐ 25 HP and over motor on board
5. Do you use your inflatable boat for diving?
A ☐ Yes B ☐ No
6. Did you use your boat to travel any long distance
(over 5 miles in any one direction) in the past year?
A ☐ Yes B ☐ No

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EVECAR ADDS BARBADOS

Evecar Travel, well-established as a scuba tour operator to Tobago, has added Barbados to its 1982 program series. In Barbados, divers are offered a choice of two resorts, Barbados Beach Village and Smuggler's Cove, on an eight day/seven night basis. Both Barbados programs offer an optional 12 dive package.

Tobago's basic five dive, eight day/seven night program features the Sandy Point Beach Club. The package may be upgraded to the Mt. Irvine Bay Hotel.

Evecar's programs feature PADI certified divemasters, airport transfers, air, tanks, weights, and a specially designed Evecar T-shirt. Also included for each diver is a one year membership in the Cousteau Society.

For reservations and other information, see your travel agent, or contact Evecar Travel, 25 W. 43rd St., New York, NY 10036; telephone (212) 354-8303 (collect).

DIVE SKILL PROGRAMS

Sea Safaris has set the dates for Lou Fead's Skill Sharpening Dive Programs, or SSDP's. The dates and locations for the six day programs are: August 7 through 14 on Bonaire; November 20 through 27 on Cayman Brac.

The SSDP's will combine lectures, skill dives and fun dives — concluding with an advanced certification for each participant. The course content will consist of diving antics, buoyancy control, underwater navigation, night diving, deep diving, plus a whole lot of just plain fun.

Participation for the SSDP's is limited. For more information, contact Sea Safaris, 3770 Highland Ave., Suite 102, Manhattan Beach, CA 90266 or call (213) 546-2464.

ST. THOMAS UNLIMITED

An Unlimited Dive Pass from the St. Thomas Diving Club, Virgin Islands, allows a diver to dive from three different dive centers on any of four dive boats. The centers are situated at St. Thomas Diving Club headquarters at Villa Olga Hotel, St. Thomas Harbor; Pineapple Beach Hotel the Atlantic Northside; Bolongo Bay Beach Hotel, the Caribbean Southside. Transportation is provided between centers. The cost for a three day Unlimited Dive Pass is \$150 and a seven day Unlimited Dive Pass is \$300.

The wreck of the *RMS Rhone* is dived each Tuesday and French Cap is scheduled on Wednesday. Both of these dives are from the *Mohawk II*.

For information contact: The St. Thomas Diving Club, P.O. Box 4976, St. Thomas, VI 00801, (809) 774-1376.

Diving Bonaire?



Bachelor's Beach Apartments

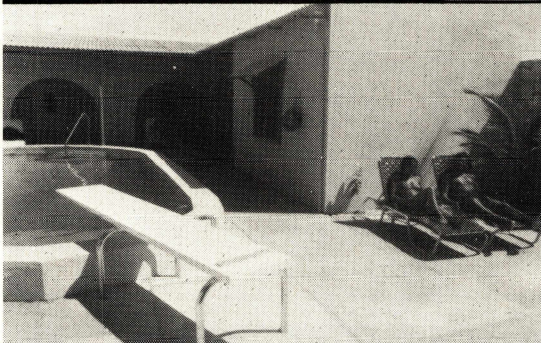
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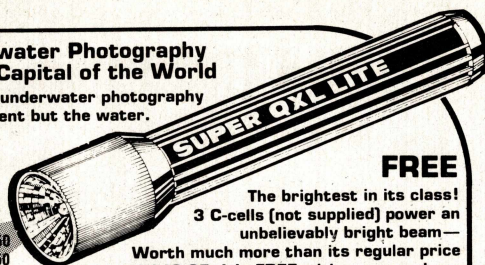
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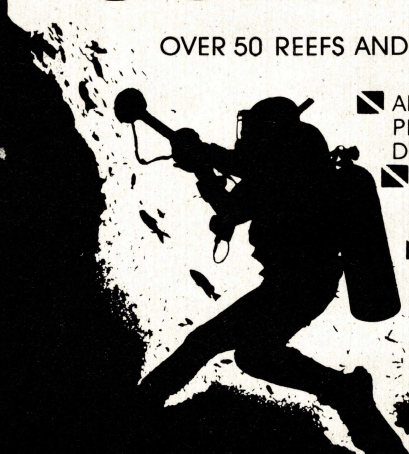
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SEACAMP

Located in the heart of the Florida Keys, Seacamp is a co-educational marine science summer camp for teenagers. Under the guidance of marine science instructors, campers are able to discover the world beneath the ocean and the delicate relationships which unite all marine organisms.

Seacamp's scuba program is designed to give the diver training in scuba techniques as a tool for underwater scientific research. The campers start with basic certification and may work their way through open water, advanced and divemaster certifications while working with scientists on research projects.

A fleet of six, 26 x 10 foot pontoon boats with twin 50 hp motors provide campers with transportation to Looe Key Marine Sanctuary — one of the prime diving research locations.

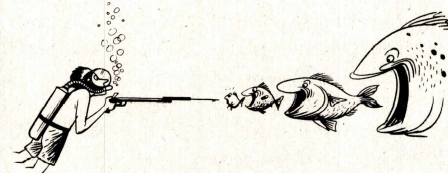
Sailing, arts and crafts, and campcraft are also included in camp programming. Seacamp will offer three 18 day sessions in 1982 for 130 campers per session. The program has operated continuously under the same director and in the same location since 1966. The Newfound Harbor Marine Institute also uses the Seacamp site for its year-round program in marine science education.

For more information contact: Seacamp Association, Inc., Route 3, Box 170, Big Pine Key, FL 33043; phone (305) 872-2331.

PARADISE DIVER LAUNCHED

The newest custom dive boat in Grand Cayman is the *Paradise Diver*, a 42 foot V-hull craft. The *Paradise Diver* is equipped with a Cummings V470 diesel engine, VHF radios, head and all standard safety equipment. According to Ron Kipp, president of Bob Soto's Diving Limited in Grand Cayman, the *Paradise Diver* is being put into service at exactly the right time. The condominium phase of the prestigious Paradise Manor Hotel is now open. The main hotel is scheduled for opening in October of 1982 and group bookings have increased to the point where a 15 diver custom boat is essential to meet the expansion needs of Bob Soto's Diving in Grand Cayman.

Mike Guderian has been selected as boat captain. A NAUI/PADI/YMCA instructor from Denton, Texas, Mike managed the five month drydock and customizing of the dive boat before being selected as captain.



MARINE ECOLOGY CAMP

SEA International will conduct a ten day camp in marine ecology beginning July 12. Students will be exposed to both marine and terrestrial sub-tropical ecology, taught by outstanding marine scientists and dive instructors. SEA Camp is open to all persons over 13 years of age. A complete scuba certification course will also be offered.

For details and applications contact Jere Hallenbeck, SEA International, 1425 Erie Blvd., East, Syracuse, New York 13210.

CLUB MED PHOTO PROGRAM

For those who dream of exploring the secrets of the ocean, Club Med Eleuthera, Bahamas makes it possible not only to learn how to dive — but also how to photograph those mysterious denizens of the deep — all at no extra charge.

Divers will be exploring some of the western hemisphere's most beautiful dive spots via daily expeditions to the Exuma Wall or the famous blue holes of the Bahamas (weather permitting).

Certified divers or those who have completed instruction at any of the club's scuba schools can join in the daily dive trips after going through a check-out dive and physical examination. All of the equipment is provided, at no extra charge, including wetsuits for those who want them.

A new dimension in diving has been added this year with the installment of a complete underwater photo laboratory at the village. Divers have free use of underwater cameras, get instruction on how to operate them, and then go off and try them. After the dive is completed each day, all the film is developed and reviewed in the afternoon with the instructor. Valuable tips on how to improve the quality of the photographs can be implemented on the following day's dive. The cameras available include Minolta Weathermetics (for shallow dives and snorkeling) plus Ricoh and Hanimex Marines (with flash) for deeper dives. A small charge is made for film and processing.

Opened in 1977, the village is almost in the middle of Eleuthera, 60 miles east of Nassau. Covering 53 acres, the club's facilities stretch from the Atlantic side to the Caribbean. On the bayside, the club's marina houses the sailing, scuba diving and snorkeling facilities along with a separate dock for water skiers. There's also an open-air seaside restaurant.

Club vacations are open to members only, with membership available to everyone. Dues are \$25 per person, per year; \$12 per year for children under 12. Information on vacations and membership for all club villages is available through any travel agent, or by calling the club's toll free number (800) 528-3100, Monday through Friday.

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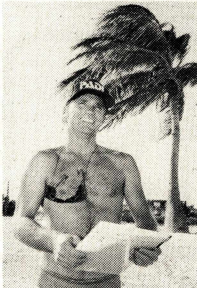
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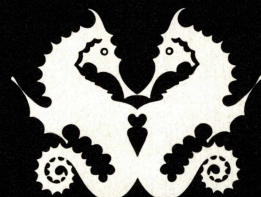
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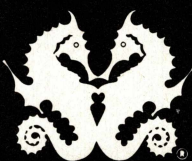
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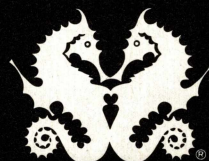
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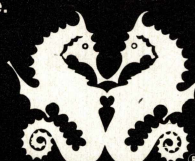
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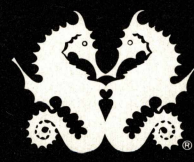
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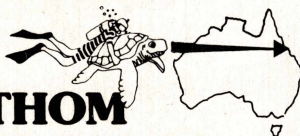
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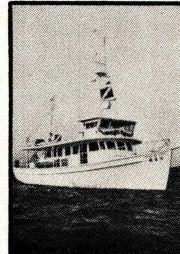
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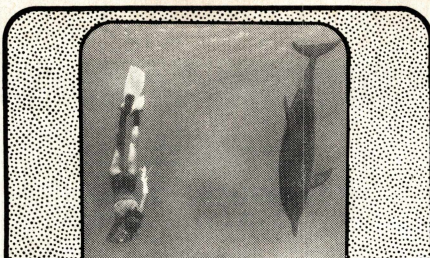
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in the June issue of

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Dive the Bridges of the Florida Keys

BY FRED HARPER

Forecast: From Key Largo to Dry Tortugas including the Florida Straits and Florida Bay, A Small Craft Advisory is in effect. Winds, 15 to 20 knots and seas, five to seven feet.

A forecast such as this can wipe out a day of diving the Florida Keys. But, before heading for the bar, consider the alternatives. The area under and near the Florida Keys bridges offer acceptable sea conditions in all but the very worst weather, and range in their appeal from just interesting to absolutely spectacular.

Take this example: We've planned a wonderful three day weekend of diving, but after the second day a front moves in. Strong winds and rough seas threaten to spoil our last day. Fortunately, an 18 foot rental boat is available, and it'll handle the four of us nicely.

There is still a slight current, so we use the hand-over-hand method of moving ourselves along the bottom and slowly upstream. One member of each buddy team is carrying a camera, and the other a goodie bag since we've been told spearfishing is prohibited, but crawfishing is legal and in season. As we pause by the anchor to re-group, and have an opportunity to look around, I realize this is a really active area. We've already seen brain and star corals, and fire coral seems to be everywhere. Lacy purple seafans and velvety whips are bent slightly in the gentle current. I've never seen such a concentration of fish, even on the reefs. Gray and blue angelfish abound, and butterflyfish dart in and out of the crevices in rocks and heads. It's obvious that a photographer could spend many hours here and never run out of new subjects. Our intent on this dive, however, is to explore, so we move up toward the bridge itself.

The first sign that the bridge is near is the presence of more manmade objects. Rubble and junk are scattered around, and there is an occasional round, regular depression in the bottom. Surprisingly, though, I don't feel the resentment that I've felt elsewhere when confronted with man's litter. Perhaps it's because fire coral covers almost everything, or perhaps it's just that the proximity of the bridge makes it all seem more logical. But wait! What is that rumbling noise? Oh



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yeah, now I remember the bridge. Must have been a truck going over. Deepening shadows tell us that the bridge is overhead and looking to the side, I see a piling. Corals and sponges have completely covered it, and the base is undercut where parts of the concrete have been eroded or broken away. There, inside one of the undercut parts are two antennae. After extracting the bug and measuring it with the gauge attached to the goodie bag, I find him to be a keeper. That takes care of my dinner; I wonder what the others plan to eat? Moving out to the sunlit side of the piling, and looking up brings yet another thrill. The effect is breathtaking as the sunlight diffuses down through the shallow water and heightens the colors and variety of textures. Swarms of sergeant majors are everywhere and blue tangs, parrotfish, and angelfish appear and disappear.

Where did the time go? I'm down to 1000 psi, and a slight current has already started from the opposite direction. It's time to move back close to the boat to finish our tanks. As we move away from the piling, I see a glint of silver and look to my right. There, silhouetted against the sunlit surface, is an absolutely magnificent tarpon. It's got to be at least 75 pounds. If fish have a beauty rating scale, the tarpon must be close to a 10. My buddy has the camera and is snapping away madly. I sure hope she gets at least one good one.

Nearing the boat, we see from the direction of the anchor line that she's already started to swing with the changing tide. We're now at 500 psi, so, regretfully, it's time to surface. Back on the boat, the excited chatter makes it obvious that everyone else had as much fun as I did. All told, we have three legal crawfish, so we only need one more to make dinner. The guy at the dive shop said there was another slack at 4:00 pm, so why not head back in, eat lunch, fill tanks, and come back at about 3:00 pm? There's no argument.

This scenario outlines a fairly typical bridge dive. Special mention should be made of the fire coral which seems to be everywhere. Some form of protective clothing or a wetsuit is advisable when diving under the bridges, as it's almost impossible to avoid touching the mustard colored stuff sometime during the dive. Remember that fire coral is included in the law prohibiting the taking of corals in U.S. waters, so stick to artifacts that have not become encrusted. I never buy filet knives, sunglasses, sinkers, or rods and reels, as many like-new objects can be recovered before Mother Nature claims them as her own. Some

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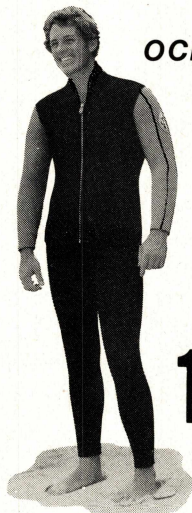
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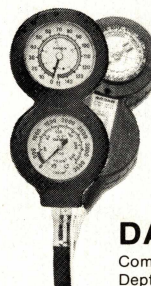


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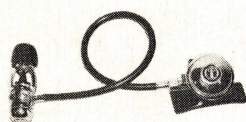
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dive clubs collect sinkers in large enough quantities to make their own weights. Watch for old glass insulators from 'phone poles of the 20's and 30's and for an occasional aqua glass bottle from the turn of the century. My favorite find was a Carter's Ink Well from the early 1900's.

The bridge areas have many of the shells found on the outer reefs, but are particularly good for the Atlantic deer cowrie (*Cypraea cervus*) and the Triton's trumpet (*Charonia variegata*). Also found in numbers are milk conchs (*Strombus costatus*). The cowries in particular have been over-collected in some areas, so please show some restraint, take only one or two adult specimens, and remember to always return the rocks to their original position.

There's a snake in every Eden, and the Florida Keys bridges are no exception. The big three here are current, visibility and boat traffic.

Since the bridges cross areas of restricted flow, the tidal flow from ocean to bay or vice versa can become quite strong. The strongest tides tend to be near the full and new moons, thus creating the worst currents. Times of slack current do not coincide with the tides, but tend to be an hour or two after the high or low tide. For accurate data, refer to the government issued current tables available in many boating supply stores. Remember that if you're diving into a slack, when the current starts again it'll come from the opposite direction. Current diving techniques should be the subject of a separate article, but I strongly recommend that you time your first few bridge dives for the slack. And, get proper instruction in current diving before you attempt diving while the current is running.

The visibility can range from lousy to pretty good. The incoming tide generally tends to bring the clearest water, and the slack following an incoming tide will sometimes produce 20 to 25 feet of visibility. Obviously, this is not the 150 feet plus that so many resorts tout, but since the water depth hardly ever exceeds 15 feet, it's not as critical. Sadly, there are also times when the visibility is closer to one or two feet!

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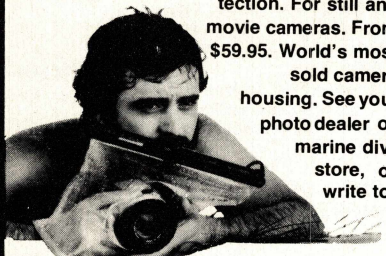
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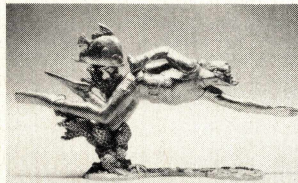


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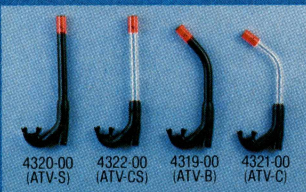
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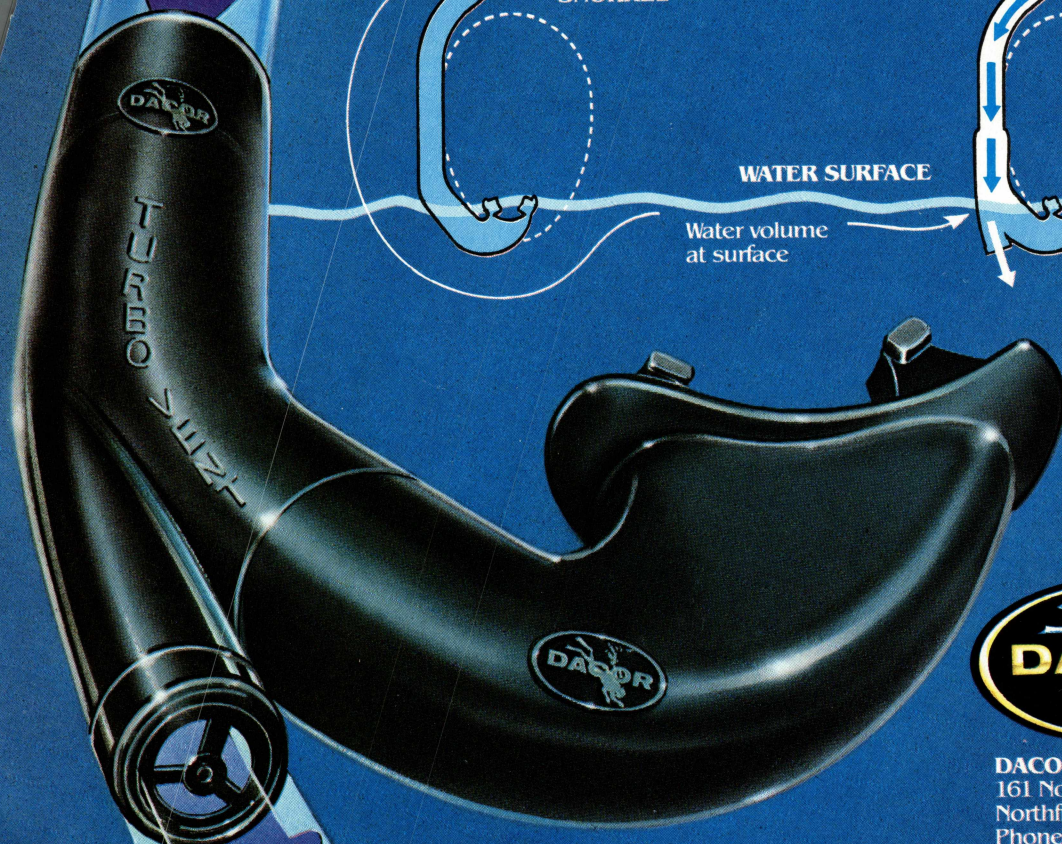
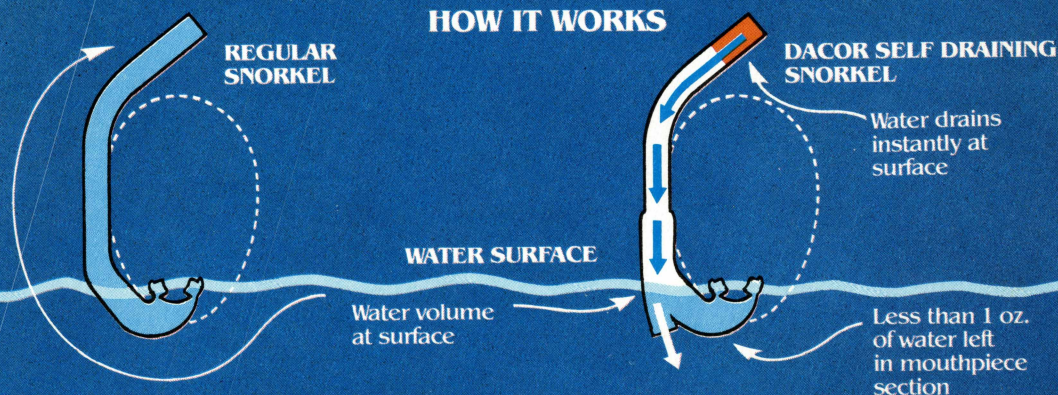
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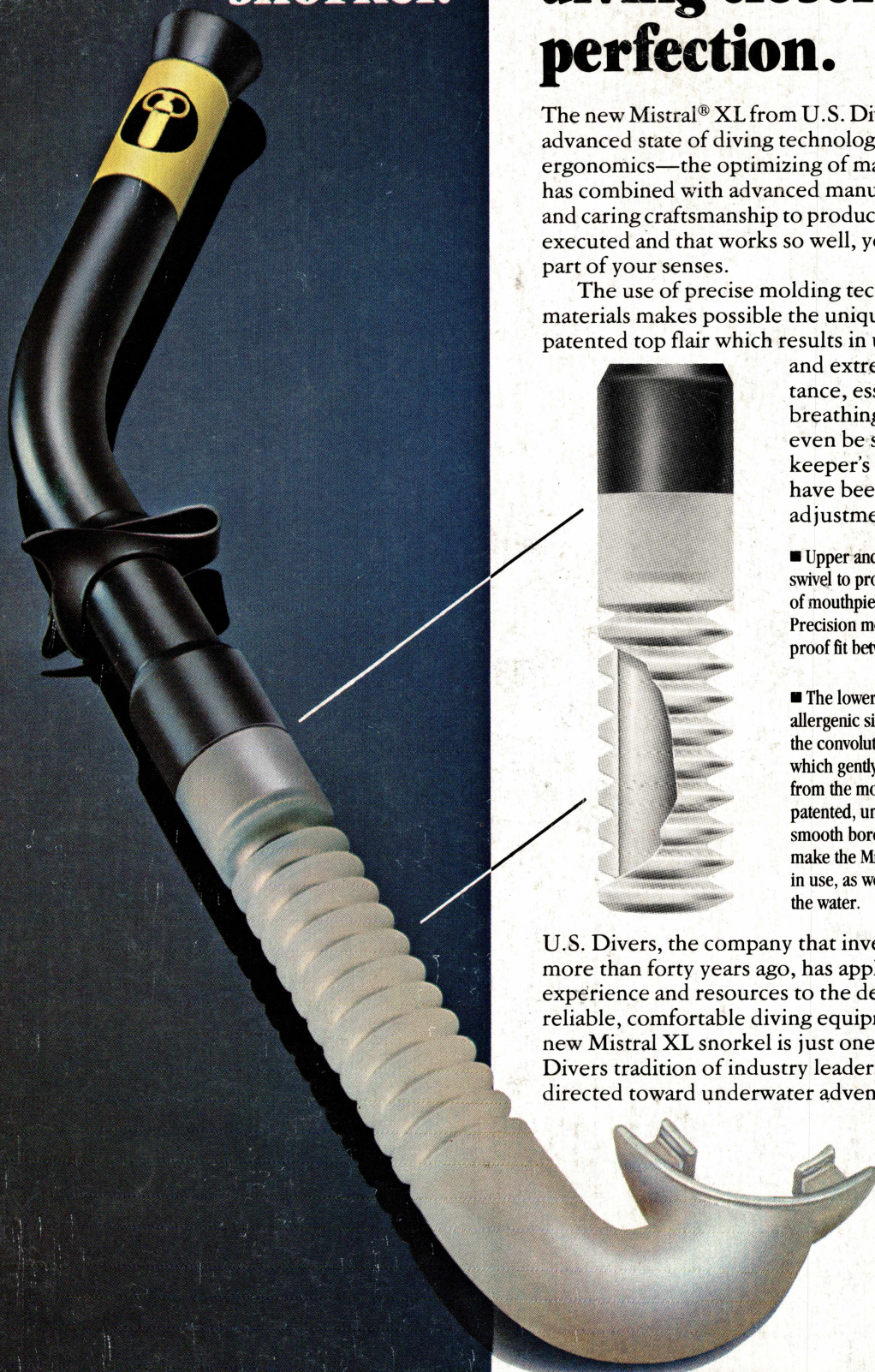


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